



Avaya Modular Messaging

Concepts and Planning Guide

for Release 3.1 with Avaya Message Storage Server
Release 3.1 with Microsoft Exchange
Release 3.1 with IBM Lotus Domino

September 2007

Notice

While reasonable efforts were made to ensure that the information in this document was complete and accurate at the time of printing, Avaya Inc. can assume no liability for any errors. Changes and corrections to the information in this document might be incorporated in future releases.

Documentation disclaimer

Avaya Inc. is not responsible for any modifications, additions, or deletions to the original published version of this documentation unless such modifications, additions, or deletions were performed by Avaya. Customer and/or End User agree to indemnify and hold harmless Avaya, Avaya's agents, servants and employees against all claims, lawsuits, demands and judgments arising out of, or in connection with, subsequent modifications, additions or deletions to this documentation to the extent made by the Customer or End User.

Link disclaimer

Avaya Inc. is not responsible for the contents or reliability of any linked Web sites referenced elsewhere within this documentation, and Avaya does not necessarily endorse the products, services, or information described or offered within them. We cannot guarantee that these links work all the time and we have no control over the availability of the linked pages.

Warranty

Avaya Inc. provides a limited warranty on this product. Refer to your sales agreement to establish the terms of the limited warranty. In addition, Avaya's standard warranty language, as well as information regarding support for this product, while under warranty, is available through the Avaya Support Web site:

<http://www.avaya.com/support>

License

USE OR INSTALLATION OF THE PRODUCT INDICATES THE END USER'S ACCEPTANCE OF THE TERMS SET FORTH HEREIN AND THE GENERAL LICENSE TERMS AVAILABLE ON THE AVAYA WEB SITE <http://support.avaya.com/LicenseInfo/> ("GENERAL LICENSE TERMS"). IF YOU DO NOT WISH TO BE BOUND BY THESE TERMS, YOU MUST RETURN THE PRODUCT(S) TO THE POINT OF PURCHASE WITHIN TEN (10) DAYS OF DELIVERY FOR A REFUND OR CREDIT.

Avaya grants End User a license within the scope of the license types described below. The applicable number of licenses and units of capacity for which the license is granted will be one (1), unless a different number of licenses or units of capacity is specified in the Documentation or other materials available to End User. "Designated Processor" means a single stand-alone computing device. "Server" means a Designated Processor that hosts a software application to be accessed by multiple users. "Software" means the computer programs in object code, originally licensed by Avaya and ultimately utilized by End User, whether as stand-alone Products or pre-installed on Hardware. "Hardware" means the standard hardware Products, originally sold by Avaya and ultimately utilized by End User.

License Type(s)

Copyright

Except where expressly stated otherwise, the Product is protected by copyright and other laws respecting proprietary rights. Unauthorized reproduction, transfer, and/or use can be a criminal, as well as a civil, offense under the applicable law.

Third-party Components

Certain software programs or portions thereof included in the Product may contain software distributed under third party agreements ("Third Party Components"), which may contain terms that expand or limit rights to use certain portions of the Product ("Third Party Terms"). Information identifying Third Party Components and the Third Party Terms that apply to them is available on the Avaya Support Web site:

<http://support.avaya.com/ThirdPartyLicense/>

Preventing Toll Fraud

"Toll fraud" is the unauthorized use of your telecommunications system by an unauthorized party (for example, a person who is not a corporate employee, agent, subcontractor, or is not working on your company's behalf). Be aware that there might be a risk of toll fraud associated with your system and that, if toll fraud occurs, it can result in substantial additional charges for your telecommunications services.

Avaya Fraud Intervention

If you suspect that you are being victimized by toll fraud and you need technical assistance or support, call Technical Service Center Toll Fraud Intervention Hotline at +1-800-643-2353 for the United States and Canada. For additional support telephone numbers, see the Avaya Support Web site:

<http://www.avaya.com/support>

Providing Telecommunications Security

Telecommunications security (of voice, data, and/or video communications) is the prevention of any type of intrusion to (that is, either unauthorized or malicious access to or use of) your company's telecommunications equipment by some party.

Your company's "telecommunications equipment" includes both this Avaya product and any other voice/data/video equipment that can be accessed by this Avaya product (that is, "networked equipment").

An "outside party" is anyone who is not a corporate employee, agent, subcontractor, or is not working on your company's behalf. Whereas, a "malicious party" is anyone (including someone who might be otherwise authorized) who accesses your telecommunications equipment with either malicious or mischievous intent.

Such intrusions might be either to/through synchronous (time-multiplexed and/or circuit-based), or asynchronous (character-, message-, or packet-based) equipment, or interfaces for reasons of:

- Utilization (of capabilities special to the accessed equipment)
- Theft (such as, of intellectual property, financial assets, or toll facility access)
- Eavesdropping (privacy invasions to humans)
- Mischief (troubling, but apparently innocuous, tampering)
- Harm (such as harmful tampering, data loss or alteration, regardless of motive or intent)

Be aware that there might be a risk of unauthorized intrusions associated with your system and/or its networked equipment. Also realize that, if such an intrusion should occur, it might result in a variety of losses to your company (including but not limited to, human/data privacy, intellectual property, material assets, financial resources, labor costs, and/or legal costs).

Responsibility for Your Company's Telecommunications Security

The final responsibility for securing both this system and its networked equipment rests with you — Avaya's customer system administrator, your telecommunications peers, and your managers. Base the fulfillment of your responsibility on acquired knowledge and resources from a variety of sources including but not limited to:

- Installation documents
- System administration documents
- Security documents
- Hardware-/software-based security tools
- Shared information between you and your peers
- Telecommunications security experts

To prevent intrusions to your telecommunications equipment, you and your peers should carefully program and configure:

- Your Avaya-provided telecommunications systems and their interfaces
- Your Avaya-provided software applications, as well as their underlying hardware/software platforms and interfaces
- Any other equipment networked to your Avaya products

TCP/IP Facilities

Customers might experience differences in product performance, reliability and security depending upon network configurations/design and topologies, even when the product performs as warranted.

Standards Compliance

Avaya Inc. is not responsible for any radio or television interference caused by unauthorized modifications of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by Avaya Inc. The correction of interference caused by such unauthorized modifications, substitution or attachment is the responsibility of the user. Pursuant to Part 15 of the Federal Communications Commission (FCC) Rules, the user is cautioned that changes or modifications not expressly approved by Avaya Inc. might void the user's authority to operate this equipment.

Federal Communications Commission Statement

Part 15:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canadian Department of Communications (DOC) Interference Information

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

European Union Declarations of Conformity



Avaya Inc. declares that the equipment specified in this document bearing the "CE" (*Conformité Européenne*) mark conforms to the European Union Radio and Telecommunications Terminal Equipment Directive (1999/5/EC), including the Electromagnetic Compatibility Directive (89/336/EEC) and Low Voltage Directive (73/23/EEC).

Copies of these Declarations of Conformity (DoCs) can be obtained by contacting your local sales representative and are available on the Avaya Support Web site:

<http://www.avaya.com/support>

Trademarks

Avaya is a registered trademark of Avaya Inc. The following are the other registered trademarks of Avaya:

- ARIA®
- AUDIX®
- DEFINITY®
- DEFINITY AUDIX®
- INTUITY AUDIX®
- INTUITY Interchange®
- OCTEL®
- SERENADE®
- Unified Messenger®

The following are the trademarks of Avaya:

- COMPAS™
- Mailbox Manager™

All non-Avaya trademarks are the property of their respective owners.

Document ordering information:

Avaya Publications Center

For the most current versions of documentation, go to the Avaya Support Web site:

<http://www.avaya.com/support>

Avaya support

Avaya provides a telephone number for you to use to report problems or to ask questions about your product. The support telephone number is 1-800-242-2121 in the United States. For additional support telephone numbers, see the Avaya Support Web site:

<http://www.avaya.com/support>

Contents

Preface	19
Audience	19
Conventions and definitions	20
Modular Messaging documentation	21
Modular Messaging support	21
Customer responsibility for system security	22
Chapter 1: Overview of Modular Messaging	23
Modular Messaging versions	23
Modular Messaging—MSS	24
Modular Messaging—Exchange or Modular Messaging—Domino	26
Comparing characteristics of Modular Messaging versions	29
Benefits of Modular Messaging	31
Scalability	31
Mobility	31
Familiar telephone user experience	32
Multilingual support	33
Ease of administration	35
Modular Messaging—MSS	35
Modular Messaging—Exchange and Modular Messaging—Domino	36
Switch integration	36
Industry standards	36
Chapter 2: Modular Messaging server components	39
Messaging application server	39
MAS services and functionality	40
Modular Messaging software components	41
Administration, diagnostic, and reporting tools	42
MAS software	44
Tracing Service	44
Mailbox Monitor Service	45
Message Waiting Indicator Service	45
Call Me Service	45
Fax Sender Service	46
Data Collection Tool	46
Web server	47
Offline Call Answer Store	47
Distributing MAS software components	48

Message store	50
Functions of a message store	50
Avaya Message Storage Server.	50
Microsoft Exchange server	51
IBM Lotus Domino server	51
Voice mail domain	53
Chapter 3: Modular Messaging interfaces	55
Telephone user interfaces.	56
Caller interface.	56
Automated Attendant	56
Avaya Common Caller Interface	57
Caller Applications.	59
Subscriber interface	60
Common subscriber log-in interface	61
Common Offline Access interface	62
Common Call Me interface	62
Features of the subscriber interface	63
Common mailbox model	64
Message categories	65
Message Waiting Indicator status	67
Call Answer greetings	67
Audible Hourglass prompt	68
Multilingual support	68
Graphical user interfaces	70
Modular Messaging Microsoft Outlook Client	72
Modular Messaging Outlook Client components	73
Installing Modular Messaging Outlook Client components.	75
Possible Microsoft Outlook profiles	76
Modular Messaging Microsoft Restricted Outlook Client.	77
Modular Messaging Restricted Outlook Client components	78
Installing Modular Messaging Restricted Outlook Client components	79
Possible Microsoft Outlook profiles	80
Comparing Modular Messaging Outlook Client and Modular Messaging Restricted Outlook Client	81
Modular Messaging IBM Lotus Notes Client.	84
Modular Messaging Lotus Notes Client components	84
Installing Modular Messaging Lotus Notes Client components	86
Possible IBM Lotus Notes profiles	87
Subscriber Options	87
Web Subscriber Options	89

Subscriber-controlled parameters from Subscriber Options and Web Subscriber Options.	91
Desktop deployment of Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, Modular Messaging Lotus Notes Client, and Subscriber Options.	92
Modular Messaging Web Client.	93
Standards-based clients with Modular Messaging—MSS	96
Avaya support policy for third-party clients	96
IBM Lotus Notes with IBM Lotus Domino Unified Communications	97
Unified Communication Center Speech Access.	98
Administrative and management interfaces	99
Message Storage Server administration	99
Mailbox Manager.	99
Avaya Integrated Management	100
MAS administration	100
Reporting capabilities	101
Chapter 4: Modular Messaging features	103
Key features and capabilities	104
Functional differences based on message store	108
Modular Messaging—Domino	116
Text-to-speech conversion capability	117
Multilingual text-to-speech	117
Simple Network Management Protocol with Modular Messaging	119
SNMP system queries	119
Logs and notifications.	120
MAS alarms and logs	120
MSS alarms and logs	121
SNMP alarm notification.	123
NMS acknowledgment of the receipt of an SNMP trap	123
Licensing	125
Audio encoding formats.	126
GSM 6.10	126
G.711	127
Recommendations for selecting audio encoding formats	127
Binary size and MIME transfer size.	128
Impacts of message size on message transfer by GUI clients	128
Communities and sending restrictions	130
System lists	132
Modular Messaging—MSS Enhanced-List Application	132

Modular Messaging—Exchange global distribution lists and Modular Messaging—Domino mailing list groups	133
Broadcasting messages.	134
Personal Distribution Lists	136
PDL members	136
PDL labels and identifiers	137
Working with PDLs	138
Creating PDLs from TUIs	138
Creating PDLs from Subscriber Options or Web Subscriber Options	139
Managing PDLs from the TUIs	140
Managing PDLs from Subscriber Options or Web Subscriber Options	140
Addressing messages to PDLs	141
Addressing from the Modular Messaging TUIs	141
Addressing from GUI clients	142
Addressing from UCC Speech Access client	143
Other PDL addressing concepts	143
Circular PDLs	143
PDLs and deleted subscribers	144
PDL address not visible to recipients	144
Message Privacy.	145
Creating private messages	145
Gaining access to private messages	146
Creating private Call Answer messages	147
The Privacy Enforcement Level parameter	148
Full privacy enforcement	148
Partial privacy enforcement.	149
Notification Only privacy enforcement.	150
TUI privacy announcement	151
Restricting client access to mailboxes.	151
Enabling or disabling POP3 and IMAP4 services	151
The Restrict Client Access COS	152
Standard RFC822 Privacy Header	152
Summary of the privacy parameters	153
Setting time zones	156
Backup capabilities	158
Backing up and restoring data from a DVD	160
Backing up and restoring data from a LAN	161
Backup considerations	161
Time and bandwidth considerations	161
Storage space calculation.	162

Restore considerations	162
Subscriber data migrations and system upgrades	163
Chapter 5: Offline Messaging	167
Messaging with message store in offline mode	168
Offline Call Answer	168
Offline access to Call Answer messages	169
Peer Failover	170
Domino Clustering	171
Messaging with e-mail clients in offline mode	172
Chapter 6: Addressing and networking	173
Addressing	174
Primary mailbox address	174
Local mailbox numbers	176
Numeric Address	176
Additional forms of addressing from the TUI	177
Dial-by-Name	177
Network address	178
Implementing networking without using prefixes	180
Additional forms of addressing from the computer user interface	180
Modular Messaging with e-mail servers	181
Modular Messaging—MSS	181
Call Answer responses within networked messaging systems	182
Responses to Call Answer messages	182
Administering Modular Messaging systems for Call Answer responses	183
Multiple mailboxes and alias extensions	186
Multiple extensions per mailbox	186
Call Answer support	186
Outcall feature support	187
Caller Application support	187
Multiple mailboxes per extension	187
Networking	188
Modular Messaging—MSS and the Message Networking server	189
Message Networking server among multiple Modular Messaging—MSS systems	190
Chapter 7: Modular Messaging and fax servers	193
Modular Messaging—MSS native fax server	194
Incoming faxes	194
Outgoing faxes	195

Providing interoperability with third-party fax servers	197
Overview of third-party fax servers.	197
Incoming faxes.	197
Requirements for third-party fax server interoperability with Modular Messaging	198
Enabling fax for subscribers	199
Routing inbound fax calls to the third-party fax server	200
Working with fax messages.	201
Fax messaging from the TUI	201
Fax Call Answer	201
Creating fax messages	202
Reviewing fax messages	203
Printing fax messages.	203
Fax messaging from the computer user interfaces	204
Modular Messaging—MSS	205
Modular Messaging—Exchange	206
Chapter 8: Telephony concepts.	207
Voice ports	208
Switch integration and telephony protocols.	209
Session Initiation Protocol	209
H.323	210
QSIG D Channel	211
T1 digital trunks	211
E1 digital trunks	211
Digital Set Emulation	212
Analog telephony interface	212
Inband DTMF integration	212
RS-232 serial integration	213
Switch integration features	214
Switch integration matrix	216
Signaling	218
Common Channel Signaling	218
Hunt groups	219
Types of hunt groups	219
Chapter 9: Support for message and call notification	221
Message notification	221
Message notification capacities	221
Message Waiting Indicator	222
Using MWI	222

MWI in offline mode	223
Configuring MWI	223
Refreshing MWI	223
Resetting MWI	224
Call Me	225
Configuring Call Me	226
Creating Call Me rules	227
Answering Call Me calls	227
Using Call Me in offline mode	227
Notify Me - Automatic	228
Notify Me capabilities	228
Configuring Notify Me - Automatic	229
Creating Notify Me - Automatic rules	230
Call notification	231
Caller-requested Notify Me	231
Configuring Caller-requested Notify Me	232
Creating Caller-requested Notify Me rules	232
Find Me	233
Configuring Find Me	234
Creating Find Me rules	234
Using Find Me in offline mode	235
Intercom Paging	235
Configuring Intercom Paging	235
Call screening from the Automated Attendant	236
Configuring call screening	236
One-number connectivity	237
Multiple notifications	237
Chapter 10: Designing voice mail domains	239
General rules for voice mail domains	240
Rules for Message Storage Server messaging environments	244
Rules for Microsoft Exchange messaging environments	246
Rules for Exchange 2007 messaging environments	246
Rules for Exchange 2003 messaging environments	247
Rules for Exchange 2000 messaging environments	247
Rules for IBM Lotus Domino messaging environments	249
Considering the proximity of the switch to e-mail message stores	250
Chapter 11: Modular Messaging system capacities	251
Voice mail domain capacities	252

Contents

Avaya Message Storage Server capacities	254
Messaging application server capacities	256
Modular Messaging—Message Storage Server	257
S3500 hardware	257
Overriding maximums	258
S3400 hardware	258
AUDIX or Serenade TUI for Modular Messaging	258
Aria TUI for Modular Messaging	260
Modular Messaging—Microsoft Exchange.	262
S3500 hardware	262
Overriding maximums	263
MAS port capacities in a software-only configuration	264
S3400 hardware	266
AUDIX or Serenade TUI for Modular Messaging	266
Aria TUI for Modular Messaging	268
Modular Messaging—IBM Lotus Domino	270
S3500 hardware	270
MAS port capacities in a software-only configuration	272
Chapter 12: Port Sizing	275
Port sizing using Modular Messaging recommendations	276
Port usage patterns	276
Modular Messaging—MSS	276
Modular Messaging—Exchange and Modular Messaging—Domino	277
Recommendations for Modular Messaging—MSS	278
Recommendations with Avaya S3500 MAS units	279
SIP integration	279
H.323 integration.	279
T1 QSIG integration	280
E1 QSIG integration	280
Digital Set Emulation integration	281
Analog integration (12-port board)	282
Analog integration (4-port board).	282
Recommendations with Avaya S3400 MAS units	283
Modular Messaging Aria TUI recommendations.	283
Modular Messaging AUDIX TUI or Serenade TUI recommendations	287
Recommendations for Modular Messaging—Exchange	291
Recommendations with Avaya S3500 MAS units	292
SIP integration	292
H.323 integration.	292

T1 QSIG integration	293
E1 QSIG integration	294
Digital Set Emulation integration	295
Analog integration (12-port board)	296
Analog integration (4-port board).	297
Recommendations with a software-only configuration	298
SIP integration	298
H.323 integration.	299
T1 QSIG integration	300
E1 QSIG integration	301
Digital Set Emulation integration	302
Analog integration (12-port board)	304
Analog integration (4-port board).	305
Recommendations with Avaya S3400 MAS units	306
Modular Messaging Aria TUI recommendations.	306
AUDIX TUI or Serenade TUI	313
Recommendations for Modular Messaging—Domino	320
Recommendations with Avaya S3500 MAS units	321
SIP integration	321
H.323 integration.	321
T1 QSIG integration	322
E1 QSIG integration	323
Digital Set Emulation integration	324
Analog integration (12-port board)	325
Analog integration (4-port board).	326
Recommendations with a software-only configuration	327
SIP integration	327
H.323 integration.	328
T1 QSIG integration	329
E1 QSIG integration	330
Digital Set Emulation integration	331
Analog integration (12-port board)	333
Analog integration (4-port board).	334
Identifying the recommended configuration for a customer	335
Estimating the additional e-mail readers required	335
Modular Messaging—MSS	336
Modular Messaging—Exchange and Modular Messaging—Domino	336
Port sizing without using Modular Messaging recommendations	337
Concepts a planner must know.	337
Estimating port requirements.	338

Contents

Calculating the busy-hour offered traffic.	339
Estimating traffic generated by incoming and outgoing calls	339
Traffic estimation guidelines	340
Total estimated port requirements	341
Calculating the number of messaging application servers required.	342
Examples of the number of MAS units recommended	342
Evaluating the additional load on the network and e-mail servers.	343
Worst-case network load	344
Chapter 13: Other planning considerations	345
Planning for redundancy	346
Messaging application server redundancy	346
N+1 server configuration for MAS redundancy	347
Message Storage Server redundancy	348
Messaging application server load balancing	350
Recommended placement of server components.	352
Recommendations for Offline Call Answer Store	356
Calculating the number of hours for message storage	357
Example of Offline Call Answer Store message storage	358
Hunt algorithm	359
Calculating the message storage capacity	360
Storage space available on message application server	360
Storage space available on the Message Storage Server.	361
Calculating the storage space on e-mail servers	361
Example of e-mail server storage capacity calculation	362
Storage planning.	363
Fax port and storage planning	365
Message retention estimate.	366
Calculating the number of desktop users per voice mail domain	367
IMAP4 client limits	367
Applications that affect client limits	368
Calculating IMAP4 client limits	368
POP3 client limits	370
Modular Messaging Web Client limits	370
Web Subscriber Options	371
Planning for port requirement	372
Centralized Modular Messaging	374
Topologies	374
Considerations when implementing centralized Modular Messaging	376

Appendix A: Grade of service	381
Appendix B: Customer environment	385
Site requirements for Avaya S3500 servers	386
Environmental requirements	386
Weight and space considerations	387
Customer-provided cabinet requirements	387
Power requirements	388
Site requirements for Avaya S3400 servers	390
Environmental requirements	390
Weight and space considerations	391
Customer-provided cabinet requirements	391
Power requirements	391
Modular Messaging and the Microsoft Windows domain infrastructure.	393
Modular Messaging—MSS	393
Private Microsoft Windows domain	393
Customer's existing Microsoft Windows domain	394
Modular Messaging—Exchange and Modular Messaging—Domino	394
Considerations when implementing Modular Messaging—MSS	395
Considerations when implementing Modular Messaging with e-mail servers	398
Best practices for Modular Messaging customer responsibilities	400
Minimum hardware requirements and supported software (MSS)	402
MAS specifications with Modular Messaging—MSS	402
Specifications of an S3500 MAS	402
Specifications of an S3400 MAS	404
Modular Messaging Outlook Client requirements	406
Modular Messaging Restricted Outlook Client requirements	406
Modular Messaging Lotus Notes Client requirements	407
Modular Messaging Web Client requirements	408
Web Client user requirements	408
Web server requirements for Modular Messaging Web Client	408
Subscriber Options requirements	409
Web Subscriber Options requirements	410
Web Subscriber Options client requirements	410
Web Subscriber Options server requirements.	410
Supplementary Server requirements	412
Administration Client requirements	414
Caller Applications Editor requirements	415
Data Collection Tool requirements	415

Contents

Requirements for the MSS administration interface	416
Mailbox Manager minimum requirements	417
Hardware requirements	417
Supported software	418
Compatibility with Avaya Integrated Management	418
Minimum hardware requirements and supported software (Exchange)	419
Messaging application server requirements.	419
Minimum hardware requirements for an MAS	419
Software requirements	422
Modular Messaging Outlook Client requirements.	424
Subscriber Options requirements	425
Web Subscriber Options requirements	425
Supplementary Server requirements.	427
Administration Client requirements	429
Caller Applications Editor requirements	429
Data Collection Tool requirements	430
Subscriber Administration Extension requirements	431
Peer Exchange Server requirements	432
Minimum hardware requirements and supported software (Domino)	433
Messaging application server requirements.	433
Minimum hardware requirements.	433
Software requirements	436
Modular Messaging DUC 1.2.3 Client requirements.	437
Subscriber Options requirements	437
For subscribers who do not use Lotus Notes	438
Web Subscriber Options requirements	438
Web Subscriber Options client requirements	438
Web Subscriber Options server requirements.	439
Supplementary Server requirements.	440
Administration Client requirements	442
Caller Applications Editor requirements	443
Peer Domino Server requirements	444
Data Collection Tool requirements	445
Other hardware and software considerations	446

Appendix C: Considerations with Message Networking server and Microsoft

Exchange	447
Appendix D: Options set on a Class-of-Service basis	451
Appendix E: Options set on a per-subscriber basis	455
Appendix F: MAS and MSS reports.	459
Messaging Application Server reports	460
Message Storage Server reports	461
Report samples	463
Glossary	477
Index	487

Preface

This guide provides:

- The concepts underlying Avaya Modular Messaging, including discussions of voice mail domains (VMDs), addressing, and telephony
- A description of the hardware and software components of Modular Messaging
- A glossary of Modular Messaging terms

Note:

Modular Messaging Release 3.1 provides enhancements to Release 3. References in this guide that are applicable only to Release 3.1 are noted. Also, all references to Release 3 also apply to Release 3.1 unless specifically noted.



Important:

Modular Messaging Release 2 and Release 3 did not support the IBM Lotus Domino message store. All information related to Modular Messaging—IBM Lotus Domino is specific to Modular Messaging Release 1.1 and Release 3.1.

Audience

This guide is for anyone who need to understand Modular Messaging, including those recommending, purchasing, designing, or installing Modular Messaging.

In addition, readers who are interested in planning for and implementing Modular Messaging must be familiar with the concepts and operation of:

- Microsoft Windows
- Microsoft Exchange server: For Modular Messaging—Microsoft Exchange version
- IBM Lotus Domino server: For Modular Messaging—IBM Lotus Domino version

Conventions and definitions

This guide uses the following conventions:

Convention	Description
Initial capital letters	Names of applications, menu items, and dialog boxes
<i>italic type</i>	Book titles
Avaya MSS	Information applicable only to Modular Messaging—Avaya Message Storage Server (MSS) version
Microsoft Exchange	Information applicable only to Modular Messaging—Microsoft Exchange version
IBM Lotus Domino	Information applicable only to Modular Messaging—IBM Lotus Domino version

This guide uses the following terms and definitions:

Term	Definition
Text messages	The term "text messages" refers to e-mail messages or messages with binary attachments, stored on the message store. The message store might be a Microsoft Exchange server, an IBM Lotus Domino server, or an Avaya MSS.
Corporate e-mail messages	The term "corporate e-mail messages" refers to e-mail messages stored on the corporate e-mail system. The corporate e-mail system might be a Microsoft Exchange server, an IBM Lotus Domino server, or any other e-mail system.
Modular Messaging—MSS	Refers to the Modular Messaging—Avaya Message Storage Server system.
Modular Messaging—Exchange	Refers to the Modular Messaging—Microsoft Exchange system.
Modular Messaging—Domino	Refers to the Modular Messaging—IBM Lotus Domino system.
Aria Telephone User Interface (TUI)	Unless otherwise noted, Aria TUI refers to the Aria TUI for Modular Messaging.

Term	Definition
AUDIX TUI	Unless otherwise noted, AUDIX TUI refers to the AUDIX TUI for Modular Messaging.
Serenade TUI	Unless otherwise noted, Serenade TUI refers to the Serenade TUI for Modular Messaging.

Modular Messaging documentation

The *Avaya Modular Messaging Documentation* CD-ROM contains documentation about Modular Messaging, including instructions for administration and maintenance. Additional documentation, such as installation and planning information, is available at <http://www.avaya.com/support>.

For switch integration (SWIN) documentation, see the configuration notes available from the Modular Messaging support representative or from the Avaya Support Center at <http://www.avaya.com/support>. Configuration notes are general guidelines that provide integration information for several types of switches and fax devices. The configuration notes include comprehensive step-by-step instructions on various tasks including configuring the Modular Messaging system for switch integration and the related switch programming.



Important:

Avaya has taken strict security measures to address security concerns of Modular Messaging customers. This guide does not cover these security features.

For information on security, see the "System security" document on the *Avaya Modular Messaging Documentation* CD-ROM. The document explains the steps that Avaya has taken to secure the Modular Messaging system. It describes how to use the system administration tools to minimize unauthorized intrusions and provides safeguards and measures that customers should take to ensure that the Modular Messaging servers operate in a secure manner.

Modular Messaging support

For Modular Messaging support and for important, up-to-date information on Modular Messaging, see <http://www.avaya.com/support>.

Customer responsibility for system security

No telecommunications system can be entirely free from the risk of unauthorized use. Customers have ultimate control over the configuration and use of the product and are solely responsible for ensuring the security of their systems.

Customers who administer and use the system can tailor the system to meet their unique needs. Therefore, customers are in the best position to ensure that the system is secure to the fullest extent possible. Customers are responsible for keeping themselves informed of the latest information for configuring their systems to prevent unauthorized use. Customers must regularly implement security patches, hot fixes, and anti-virus updates. System managers and administrators are also responsible for reading all recommendations, installation instructions, and system administration documents provided with the product. This information can help them understand the features that might introduce risk of toll fraud, and the steps they must take to reduce that risk.

Avaya does not guarantee that this product is immune from or will prevent unauthorized use of telecommunications services or facilities accessed through or connected to this product. Avaya is not responsible for any damages or charges that result either from unauthorized uses or from incorrect installations of the security patches that are made available periodically. To aid in combating these crimes, Avaya maintains strong relationships with its customers and supports law enforcement officials in apprehending and successfully prosecuting those responsible.

Report suspected security vulnerabilities with Avaya products to Avaya by sending e-mail to securityalerts@avaya.com. Reported vulnerabilities are prioritized and investigated. Any corrective actions resulting from the vulnerability investigation are posted at <http://support.avaya.com/security>. Whether immediate support is required, report all toll fraud incidents perpetrated on Avaya services to Avaya Corporate Security at securityalerts@avaya.com.

In addition to recording the incident, Avaya Corporate Security is available for consultation on:

- Product issues
- Investigation support
- Law enforcement
- Education programs

For more information about system security, see "[Modular Messaging and Security](#)" on the *Avaya Modular Messaging Documentation* media.

Chapter 1: Overview of Modular Messaging

This chapter introduces the Avaya Modular Messaging versions and provides a comparison of some key characteristics of these versions. The chapter also lists the benefits of Modular Messaging.

This chapter includes the following topics:

- [Modular Messaging versions](#) on page 23
- [Comparing characteristics of Modular Messaging versions](#) on page 29
- [Benefits of Modular Messaging](#) on page 31

Modular Messaging versions

Modular Messaging is a unified messaging solution that addresses the different unified messaging needs of customers. To suit the particular architectural needs and e-mail infrastructure of customers, Modular Messaging is available in the following versions:

- Modular Messaging—Avaya Message Storage Server (Modular Messaging—MSS)

This configuration contains one or more Avaya messaging application server (MAS) units and a single Avaya MSS. The Avaya MSS is available in two versions: MSS—standard availability (MSS—S) and MSS—high availability (MSS—H). A private Ethernet local area network (LAN) connects the MAS and the MSS. This configuration is also known as the Avaya Message Servers.

Note:

In a configuration with multiple MAS units, all the MAS units must be physically co-located with the MSS and must be on the same LAN segment as the MSS.

- Modular Messaging—Microsoft Exchange (Modular Messaging—Exchange)

This configuration contains one or more MAS units connected to one or more Microsoft Exchange servers. The MAS units are provided either by Avaya or by the customer. Avaya provides the Modular Messaging software that must be installed on the customer-provided MAS. The Microsoft Exchange servers are customer provided.

- Modular Messaging—IBM Lotus Domino (Modular Messaging—Domino)

Applicable only to Modular Messaging Release 1.1 and Release 3.1. This configuration contains one or more MAS units connected to one or more IBM Lotus Domino servers. The MAS units are provided either by Avaya or by the customer. Avaya provides the Modular Messaging software that must be installed on the customer-provided MAS. The IBM Lotus Domino servers are provided by the customer.

Note:

For information on the hardware and software requirements of a customer-provided MAS, see [Table 148](#), [Table 151](#), and [Table 153](#).

Although these versions have functionality in common, such as Call Answer and telephone access to voice messages, they differ in their implementation, architecture, and configuration.

Depending on the version, Modular Messaging can be used as any one of the following solutions:

- A voice and fax messaging system, in which all voice and fax messages are stored on the Avaya MSS.
- A part of a unified messaging solution for access to messages. Voice, text, and fax messages are stored on the Avaya MSS, and corporate e-mail is maintained on a separate corporate e-mail system.
- A voice, fax, text, and e-mail messaging system, in which all messages are stored on a common message store—either Microsoft Exchange or IBM Lotus Domino.

Modular Messaging—MSS

Avaya MSS

A Modular Messaging—MSS system can be configured for use as:

- A voice mail system providing only voice and fax messaging
- Part of a unified messaging solution for access to messages

In the latter scenario, voice, text, and fax messages are stored on the MSS, and corporate e-mail is stored on the corporate e-mail system.

Unified Access

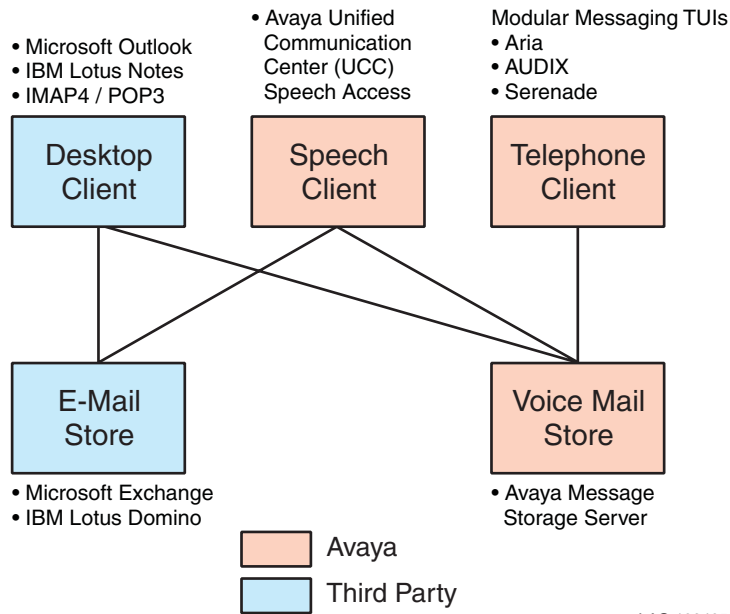


Figure 1: Unified access of messages through Modular Messaging—MSS

Subscribers can use the following interfaces and clients of Modular Messaging:

- The Modular Messaging telephone user interfaces (TUIs) to access messages stored on the MSS
- Unified Communication Center (UCC) Speech Access for telephone access to voice mail messages and e-mails stored on Microsoft Exchange or IBM Lotus Domino
- An Internet Messaging Access Protocol 4 (IMAP4)-compatible e-mail client for desktop access to messages stored on both the MSS and the corporate e-mail system

As a stand-alone messaging solution, Modular Messaging—MSS is an ideal solution for organizations that have traditional voice mail usage and that intend to maintain separate e-mail and voice mail systems.

This configuration is likely to be attractive to customers that want independent voice mail and corporate e-mail systems for overall messaging reliability. Modular Messaging mailboxes on the Avaya MSS store voice, fax, and text messages and binary attachments that subscribers receive. These Modular Messaging mailboxes are independent of the mailboxes on the corporate e-mail system that receive and store corporate e-mail messages. Because the voice mail and e-mail systems are independent of each other in this configuration, if one of the systems is not operating, the other is still likely to be available.

Subscribers can use different devices, such as a touchtone telephone or a desktop computer, to access messages stored in their Modular Messaging mailboxes.

The following access media provide subscribers with unified access to messages:

- Touchtone telephone for access to voice and fax messages.
- UCC Speech Access for telephone access to voice and fax messages and to corporate e-mail messages.
- Modular Messaging Microsoft Outlook Client and Modular Messaging Restricted Outlook Client for Outlook access to voice, fax, and text messages. Users can gain access to all messages stored in their Modular Messaging inbox with the same client that is used to obtain access to corporate e-mail messages.
- Modular Messaging IBM Lotus Notes Client for Lotus Notes access to voice, fax, and text messages. Users can gain access to all messages stored in their Modular Messaging inbox with the same client that is used to obtain access to corporate e-mail messages.
- Modular Messaging Web Client for access to voice, fax, text, and corporate e-mail messages from a Web browser.
- Standards-based e-mail client for desktop access to voice, text, and fax messages. Modular Messaging—MSS supports IMAP4 and Post Office Protocol 3 (POP3) e-mail standards and text messages, allowing subscribers to access their Modular Messaging mailbox by means of standards-based e-mail clients. These messages are stored in an inbox separate from the corporate inbox that receives e-mail messages from the corporate e-mail system.

Note:

Through administrative settings, administrators can restrict access to a subscriber mailbox from standard-based clients. For more information, see [The Privacy Enforcement Level parameter](#) on page 148.

A fax-capable solution, Modular Messaging—MSS makes use of native fax resources to:

- Allow subscribers to send fax messages.
- Allow callers to leave fax messages. Callers can also leave a message that contains a voice introduction, followed by a fax. This results in a single message with both voice and fax components.

Note:

H.323 integration currently does not support fax messaging.

Modular Messaging—Exchange or Modular Messaging—Domino

Microsoft Exchange

IBM Lotus Domino

A Modular Messaging—Exchange or Modular Messaging—Domino system is a voice messaging front end that integrates with an existing Microsoft Exchange or IBM Lotus Domino e-mail system, providing a unified message store for all messages.

The existing e-mail system serves as the message store for corporate e-mail messages, voice messages, and fax messages.

In Modular Messaging with e-mail servers, voice mail is merged into, and therefore relies on, the Microsoft Exchange or IBM Lotus Domino e-mail infrastructure. Modular Messaging is designed in a store-and-forward fashion, so it continues to operate during network or e-mail outages. During such outages, full functionality is not available, but the system continues to provide basic Call Answer and limited access to recent Call Answer messages.

Modular Messaging—Exchange and Modular Messaging—Domino provide subscribers with access to voice, fax, and e-mail messages from a single graphical user interface (GUI)—their existing e-mail client.

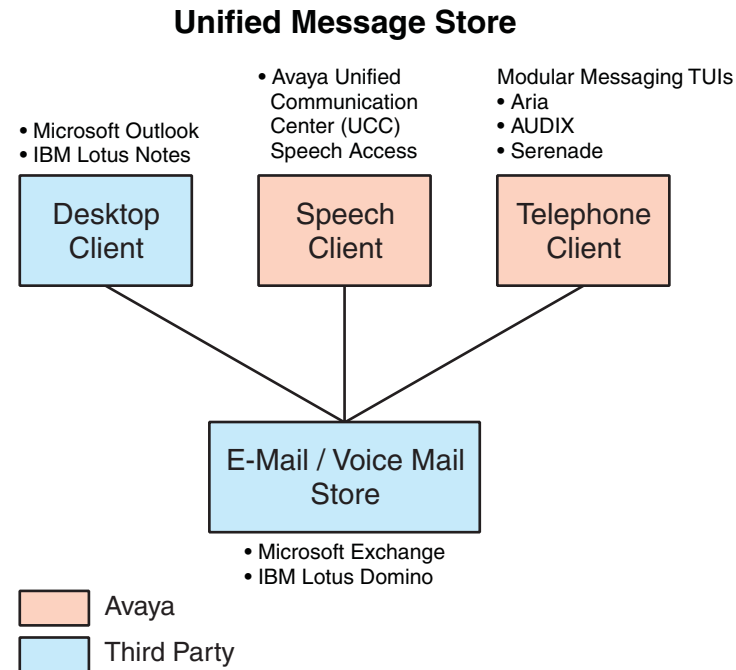


Figure 2: Modular Messaging—Exchange or Modular Messaging—Domino as a unified message store for all messages

For unified access to messages, subscribers can use the following access media:

- A touchtone telephone for access to all messages.
- UCC Speech Access for telephone access to all messages.
- Microsoft Outlook e-mail client for desktop access to all messages, using the Avaya Modular Messaging Microsoft Outlook Client. Not applicable to Modular Messaging—Domino.
- IBM Lotus Notes with IBM Lotus Domino Unified Communications (DUC). Subscribers can integrate the IBM Lotus DUC software with their IBM Lotus Notes Client for access to all messages. Not applicable to Modular Messaging—Exchange.

Consider the following:

Overview of Modular Messaging

- IBM Lotus DUC cannot be integrated with the Microsoft Outlook e-mail client.
- IBM provides the DUC software. Avaya does not provide the DUC software.
- Web access to messages by using Outlook Web Access, for Microsoft Exchange message stores only, and iNotes, for IBM Lotus Domino message stores only.
- Any desktop client supported by Microsoft Exchange or IBM Lotus Domino.

Modular Messaging—Exchange and Modular Messaging—Domino interoperate with a customer-provided, third-party fax server to provide fax capabilities.

Comparing characteristics of Modular Messaging versions

[Table 1](#) compares the characteristics of the three Modular Messaging versions:

- Modular Messaging—MSS
- Modular Messaging—Exchange
- Modular Messaging—Domino

Table 1: Comparing Modular Messaging versions

Characteristic	Modular Messaging—MSS	Modular Messaging—Exchange	Modular Messaging—Domino
Storing messages	Voice, text, fax messages, and messages with binary attachments are stored on the MSS. Corporate e-mail messages, if any, are usually stored on a separate e-mail server.	All messages are stored on the Microsoft Exchange e-mail server.	All messages are stored on the IBM Lotus Domino e-mail server.
Retrieving messages	Subscribers use a telephone to retrieve messages (Modular Messaging TUIs) or a desktop computer to retrieve messages. Subscribers cannot use the TUIs to retrieve corporate e-mail messages stored on a separate e-mail server.	Subscribers use a telephone or desktop computer to retrieve voice, fax, and corporate e-mail messages.	Subscribers use a telephone or desktop computer to retrieve voice, fax, and corporate e-mail messages.
Available TUIs	Aria TUI, AUDIX TUI, and Serenade TUI.	Aria TUI, AUDIX TUI, and Serenade TUI.	Aria TUI, AUDIX TUI and Serenade TUI.

Table 1: Comparing Modular Messaging versions (continued)

Characteristic	Modular Messaging—MSS	Modular Messaging—Exchange	Modular Messaging—Domino
Desktop GUIs for accessing the inbox	The Modular Messaging inbox containing voice, fax, and text messages is separate from the corporate e-mail inbox. With the Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, the Modular Messaging Lotus Notes Client, or with standards-based e-mail clients, subscribers have the benefit of accessing two separate inboxes in the same e-mail client.	Voice and fax messages in the subscriber's e-mail mailbox are accessible by using any Microsoft Exchange client, such as Microsoft Outlook or Outlook Web Access (OWA).	Voice and fax messages in the subscriber's e-mail mailbox are accessible by using any IBM Lotus Domino client, such as IBM Lotus Notes or iNotes.
Text-to-speech (TTS) conversion	TTS is required for playing subscriber names (when not recorded), fax header information, and any text messages in the Modular Messaging mailbox.	TTS is required for playing subscriber names (when not recorded), fax header information, and corporate e-mail messages.	TTS is required for playing subscriber names (when not recorded), fax header information, and corporate e-mail messages.
Web messaging	Modular Messaging Web Client provides Web-browser access to voice, text, fax, and corporate e-mail messages.	OWA provides a single interface for access to voice mail and corporate e-mail messages, stored in a common inbox on the Microsoft Exchange message store.	iNotes, also known as IBM Lotus Domino Web Access, provides a single interface for access to voice mail and corporate e-mail messages, stored on the IBM Lotus Domino message store.
Compatibility with UCC Speech Access	UCC Speech Access provides: <ul style="list-style-type: none"> • Speech access to voice mail and corporate e-mail messages • Launching of telephone calls • Conferencing 		

Benefits of Modular Messaging

Modular Messaging is compatible with several industry telecommunications systems, offering service from 4 to 240 ports and up to 100,000 subscribers. Modular Messaging provides multilingual capabilities, thus supporting international operations.

Note:

The Modular Messaging version determines the maximum number of ports and subscriber mailboxes the system can support.

Scalability

Depending on the version, Modular Messaging supports from 4 to 240 ports within a single voice mail domain (VMD).

Modular Messaging—MSS supports a maximum of 144 ports per VMD.

Modular Messaging—Exchange and Modular Messaging—Domino support a maximum of 240 ports per VMD.

Note:

A VMD can serve a network of switches, provided that the administrator ensures that the network uses a single switch as a gateway to the VMD. The network of switches must contain switches that belong to the same family. Modular Messaging does not support a network of heterogeneous switches. For more information on a VMD, see [Voice mail domain](#) on page 53.

Mobility

With Modular Messaging, subscribers can send and retrieve messages even when they are away from the office.

Modular Messaging provides subscribers with mobile access to their messages from any touchtone telephone, using the Modular Messaging TUIs. With the Microsoft Exchange or IBM Lotus Domino versions, the TUI provides access to voice mail and corporate e-mail messages. With the MSS version, the TUIs provide access only to voice, fax, and text messages stored on the Avaya MSS and *not* to corporate e-mail messages stored on the corporate e-mail system. However, MSS subscribers that want mobile access to corporate e-mail messages can use either of the following clients:

- UCC Speech Access client

UCC Speech Access provides speech access and voice control of corporate e-mail and voice mail messages, regardless of whether they are stored in separate or unified message

stores. For more information, see [Unified Communication Center Speech Access](#) on page 98.

- **Modular Messaging Web Client**

Modular Messaging Web Client is a visual interface to the Modular Messaging mailbox. Using that interface, subscribers can create, send, receive, and organize messages. Subscribers can listen to voice messages, read text and corporate e-mail messages, view fax messages, and manage file attachments, all from their computers.

Modular Messaging also provides enhanced notification functionality, allowing quick response to any type of incoming communication, whether on site or remote. Subscribers can reply to a message, regardless of its original form.

Modular Messaging supports real-time Find Me capability, telephone notification, Message Waiting Indicator (MWI), and other advanced notification mechanisms, thus increasing subscriber availability.

Note:

Find Me is not supported for analog integrations.

Familiar telephone user experience

Subscribers can use the Modular Messaging TUIs from any touchtone telephone to gain access to, compose, and send messages and to configure their mailboxes.

The subscribers of the following TUIs will have a familiar telephone user experience with the Modular Messaging TUIs:

- Avaya Octel 200/300, using the Serenade TUI
- Avaya Octel 250/350, using the Aria TUI
- Intuity AUDIX
- DEFINITY AUDIX

Modular Messaging comes with the followings TUIs:

- Aria TUI for Modular Messaging
- AUDIX TUI for Modular Messaging
- Serenade TUI for Modular Messaging

Administrators can assign subscribers their preferred TUI, based on Class-of-Service (COS). The Modular Messaging TUIs are similar to, but not exactly the same as, the respective Aria, AUDIX, or Serenade product.

For more information on the TUIs, see [Telephone user interfaces](#) on page 56.

Multilingual support

Modular Messaging supports multiple languages and allows multinational organizations to use the system in virtually any worldwide office.

[Table 2](#) describes the different languages that Modular Messaging supports for announcements and for visual interfaces.

Of the languages that Modular Messaging supports:

- One language is defined as the system default language.
- Up to three languages can be defined for the system Automated Attendant.
- Up to three languages per mailbox can be defined for Call Answer. One assigned Call Answer language can be Teletypewriter (TTY).
- One language can be specified per mailbox for logged-in messaging sessions.

Table 2: Modular Messaging multilingual support

Languages		Voice Interfaces							Visual Interfaces									
		Aria Caller interface MM ¹ Release 1.1	Common Caller Interface MM ¹ Release 3	MM ¹ Aria TUI	MM ¹ AUDIX TUI	MM ¹ Serenade TUI	Message Networking ²	Text-to-Speech (TTS) ³	Subscriber Options	Web Subscriber Options	MM ¹ Microsoft Outlook Client ⁴	MM ¹ Microsoft Restricted Outlook Client ⁵	MM ¹ IBM Lotus Notes Client ⁵	Web Client ⁶	Avaya Voice Player	Fax Cover Page ⁵	MAS Administration	MSS Administration
Arabic			Y	Y	Y	Y												
Chinese	• Mandarin (China)	Y	Y	Y	Y	Y	Y	Y										
	• Mandarin (Taiwan)	Y	Y	Y	Y	Y	Y	Y										
	• Simplified								Y	Y	Y			Y	Y	Y		
	• Traditional								Y	Y	Y			Y	Y	Y		
Czech			Y	Y	Y	Y												
Danish			Y	Y	Y	Y		Y										
Dutch		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y		

Table 2: Modular Messaging multilingual support (continued)

Languages		Voice Interfaces							Visual Interfaces									
		Aria Caller interface MM ¹ Release 1.1	Common Caller Interface MM ¹ Release 3	MM ¹ Aria TUI	MM ¹ AUDIX TUI	MM ¹ Serenade TUI	Message Networking ²	Text-to-Speech (TTS) ³	Subscriber Options	Web Subscriber Options	MM ¹ Microsoft Outlook Client ⁴	MM ¹ Microsoft Restricted Outlook Client ⁵	MM ¹ IBM Lotus Notes Client ⁵	Web Client ⁶	Avaya Voice Player	Fax Cover Page ⁵	MAS Administration	MSS Administration
English	● Australia	Y	Y	Y		Y	Y											
	● UK	Y	Y	Y	Y	Y	Y	Y										
	● Standard								Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	● US-123	Y	Y	Y	Y	Y	Y	Y										
	● US-ABC				Y			Y										
	● US-TTY ⁷	Y	Y	Y	Y	Y	Y											
French	● Canada	Y	Y	Y	Y	Y	Y											
	● France	Y	Y	Y	Y	Y	Y											
	● Standard							Y	Y	Y	Y			Y	Y	Y		
German		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y		
Hebrew			Y	Y	Y	Y												
Italian		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y		
Japanese		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y		
Korean			Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y		
Portuguese Brazilian		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y		
Russian			Y	Y	Y	Y		Y										
Spanish	● Castilian		Y	Y	Y	Y	Y	Y										
	● Latin American	Y	Y	Y	Y	Y	Y	Y										
	● International								Y	Y	Y			Y	Y	Y		

1. MM=Modular Messaging.

2. Message Networking includes audio and text announcements indicated in this column. Message Networking administrative interfaces are available only in English.

3. The TUIs of Modular Messaging—Exchange and Modular Messaging—Domino automatically provide TTS conversions based on the language of the e-mail message.

4. Applicable only to Modular Messaging—MSS and Modular Messaging—Exchange. The Modular Messaging Outlook Client does not support Microsoft Multilingual User Interface (MUI) packs.
5. Applicable only to Modular Messaging—MSS.
6. Web Client includes the subscriber interfaces indicated in this column. Web Client administrative interfaces are available only in English.
7. Customer systems that use TTY must use G.711 audio encoding.

Ease of administration

All versions of Modular Messaging, regardless of whether they have unified or separate message stores, provide certain administrative benefits.

Modular Messaging—MSS

Avaya MSS

Modular Messaging—MSS is based on industry standards, including Lightweight Directory Access Protocol (LDAP). Modular Messaging—MSS interoperates with the following Avaya administrative tools to facilitate common administration across multiple Avaya products:

- Avaya Site Administration Release 2 or later and Avaya MultiSite Administration Release 2.1 or later: These applications support Modular Messaging subscriber data. For more information, see [Avaya Integrated Management](#) on page 100.
- ProVision: This application is used to provision users on an Avaya Communication Manager or a DEFINITY switch and Modular Messaging.
- Mailbox Manager application: Modular Messaging—MSS administrators can use this application for mailbox administration. For more information, see [Mailbox Manager](#) on page 99.
- Directory Enabled Management (DEM): This interface, an add-on to Avaya Communication Manager, connects the Avaya Directory Server with the Modular Messaging system. DEM periodically queries the Modular Messaging—MSS for changes to the subscriber administrative attributes, through LDAP. If a change occurs, DEM updates customer directories with the changed information. Thus, DEM uses the Avaya Directory Server to facilitate administration of Modular Messaging—MSS systems from a central location.

Web-based administration of the MSS facilitates common organization-wide administration, diagnostics, and reporting. Administrators can use these Web-based administration pages to perform general system administration for the MSS and subscriber administration. Administration tasks include subscriber management and password administration. These administration pages also provide diagnostic logs.

Modular Messaging—Exchange and Modular Messaging—Domino

Microsoft Exchange

IBM Lotus Domino

Modular Messaging—Exchange and Modular Messaging—Domino offer the following administrative benefits:

- Leveraging the existing Microsoft Exchange or IBM Lotus Domino infrastructure eliminates the need to retain and manage separate voice and corporate e-mail systems.
- For each subscriber, all voice mail, telephone answering, corporate e-mail, and fax messages are stored on the same message store server.
- A single administrator can handle all messaging administration.
- Management tools are combined into one application.
- A single directory for addressing voice mail and corporate e-mail simplifies system management.
- Updates to the directory are replicated automatically to all systems, so that changes need to be made only once for voice mail and e-mail.

Switch integration

Modular Messaging supports multiple switch integrations (SWINs) for switches and private branch exchanges (PBXs) from several major manufacturers. Customers can choose a SWIN that requires only minimum changes to the current infrastructure to implement Modular Messaging.

Industry standards

Modular Messaging supports the following industry standards:

- Industry-standard platforms, telephony interfaces, and operating systems:
 - Intel processors
 - Dialogic Tip/Ring boards, Dialogic T1 and E1 port boards, and Dialogic Digital Set Emulation (DSE) port boards

Note:

Dialogic port boards require PCI-X slots. Customer-provided hardware must be ordered with the PCI-X bus type in order to support the Dialogic port boards.

- Linux operating system for Avaya MSS and Microsoft Windows operating system for MAS

- IP and Internet standards:
 - IP for server-to-server transport
 - IP networking
 - IMAP4 and POP3 client access to messages
 - SMTP/MIME for sending and receiving messages
 - LDAP for attribute storage and directory queries. Attribute storage includes user and system data, and directory queries include name and address.
- SWINs: Session Initiation Protocol (SIP), H.323, Q.Signaling (QSIG), Enhanced Inband Analog, RS-232 for serial SWINs such as Simplified Message Desk Interface (SMDI) or Simplified Message Service Interface (SMSI), and DSE
- Fax standard: Tag Image File Format (TIFF)/F Profile for Facsimile Dialogic format
- Audio encoding formats: Global System for Mobile Communications (GSM) 6.10 and G.711, A-law and μ -law. GSM 6.10 has a coding rate of approximately 13 kilobits per second (kbps) or 1.6 Kilobytes per second (KBps). G.711 has a coding rate of approximately 64 kbps or 8 KBps. As GSM 6.10 requires only 13 kbps to encode, GSM 6.10-encoded messages require a considerably smaller amount of storage, as compared to G.711-encoded messages. For example, a 60-second voice message when encoded requires approximately:
 - 95.2 KB when encoded using the GSM 6.10 format
 - 468.8 KB when encoded using the G.711 format

G.711 provides higher voice quality than GSM 6.10 even in heterogeneous networks that require multiple audio encoding and decoding. Therefore, Avaya recommends the use of G.711 as the audio encoding format for Modular Messaging.
- Modular Messaging complies with standards established by the U.S. government and standards bodies for mandatory compliance areas, such as:
 - Product Safety
 - Electro Magnetic Compliance (EMC)
 - Telecommunications
- Compliance with Section 508 and Section 255: Modular Messaging Release 3 complies with Section 508 of the Rehabilitation Act and Section 255 of the Communications Act. These sections deal with the usability of a product by people with motor-skill impairments.

Chapter 2: Modular Messaging server components

This chapter provides a description of the server components of Avaya Modular Messaging.

This chapter includes the following topics:

- [Messaging application server](#) on page 39
- [Message store](#) on page 50
- [Voice mail domain](#) on page 53

Messaging application server

The voice server provides an interface between the message store (and directory) and the telephone system. In Modular Messaging, the voice server is known as the messaging application server (MAS).

A Modular Messaging—Avaya MSS system consists of at least one MAS and an Avaya Message Storage Server (MSS). Modular Messaging—MSS supports a maximum of five MAS units in a voice mail domain (VMD) plus an optional Supplementary Server.

Note:

In a VMD with multiple MAS units, all the MAS units must be physically co-located with the MSS and must be on the same LAN segment as the MSS.

In Modular Messaging Release 3, all new installations of the MAS software reside on the Avaya-provided S3500 server platform running Microsoft Windows 2003 Server Application Kit (SAK) with Service Pack 1 (SP1). The MAS software of the upgraded Modular Messaging releases can reside on the Avaya-provided S3400 server platform.

A Modular Messaging—Microsoft Exchange or Modular Messaging—IBM Lotus Domino system consists of at least one MAS connected to at least one back-end message store server (Microsoft Exchange server or IBM Lotus Domino server). With Microsoft Exchange or IBM Lotus Domino, Modular Messaging supports a maximum of 10 MAS units in a VMD plus an optional Supplementary Server.

In Modular Messaging Release 3, the MAS software can reside on the Avaya-provided S3500 server platform or S3400 server platform. The S3500 server platform must be running Microsoft Windows 2003 SAKit with SP1. The MAS software can also reside on a customer-provided server platform running Microsoft Windows 2003 Standard Edition with SP1. The customer-provided server platform must meet the minimum requirements that Avaya specifies. For more information, see [Messaging application server requirements](#) on page 419.

MAS services and functionality

An MAS provides the following services and features:

- Inbound services

An MAS provides support to inbound services, such as Call Answer, subscriber access, offline access to Call Answer messages, dual-connect for graphical user interface (GUI) access, Automated Attendant, Caller Applications, and inbound fax.

Note:

In single-connect mode, a subscriber plays or records messages by means of a multimedia computer. In dual-connect mode, a subscriber uses the computer for command and control and uses the telephone for listening to and recording a message.

- Outbound services

An MAS provides support to outbound services, such as Find Me, Call Me, Notify Me, Message Waiting Indicator (MWI), Automated Attendant transfers, and outbound fax (MSS only).

- Software components

An MAS hosts server software components, such as Tracing Service, Mailbox Monitor Service, MWI Service, Call Me Service, and Fax Sender Service (MSS only).

For more information, see [Modular Messaging software components](#) on page 41.

- Key functions and applications

An MAS provides switch integrations (SWINs), the telephone user interface (TUI), voice encoding and decoding, alarming and event tracking, statistics and performance counters, operation history, fax capability, and text-to-speech (TTS) capability.

Client applications, such as system administration tools and diagnostic and reporting tools are not uniquely associated with the MAS but are required on each MAS.

Note:

In a client/server architecture, a software server provides services to its related clients. A hardware server is the computer that runs one or many software applications and servers. In Modular Messaging—MSS, an Avaya S3500 or S3400 is a hardware server that can run multiple software servers. For example, in a single MAS VMD, all software-based servers are on a single S3500 hardware server or on a single S3400 hardware server. In Modular Messaging—Exchange and Modular Messaging—Domino, an Avaya S3500 or S3400 or an customer-provided server is a hardware server that can run multiple software servers.

Modular Messaging software components

The Modular Messaging software provides all the software components that must be installed on a customer-provided MAS or on an Avaya MAS.

In new installations of Modular Messaging Release 3, if a VMD contains more than one MAS, all the components are installed on all the MAS units. However, the administrator cannot enable all the components on all the MAS units. For example, the administrator can enable Tracing Service on an MAS and Call Me Service on another MAS. When you upgrade a Modular Messaging—MSS system, the missing components will be installed on all the MAS units but will not be enabled. However, when you upgrade components, the missing components on the MAS units are not installed.

See [Table 5](#) for information on enabling the MAS components in a multi-MAS VMD. For information on which component should be enabled on which MAS, see [Recommended placement of server components](#) on page 352.

The Modular Messaging software components are:

- Administration, diagnostic, and reporting tools
- MAS software and prompt files
- Tracing Service
- Mailbox Monitor Service
- MWI Service
- Call Me Service
- Fax Sender Service
- Data Collection Tool
- Web server
- Offline Call Answer Store

Administration, diagnostic, and reporting tools

[Table 3](#) describes the various Modular Messaging administration tools.

Table 3: Modular Messaging administration tools

Administration tool	Description
Voice Mail System Configuration	<p>Use the Voice Mail System Configuration (VMSC), a software application, to configure and maintain voice mail systems. VMSC facilitates configuration of properties that are shared across MASSs grouped in a VMD and properties that are specific to an MAS. Properties that are shared across MASSs can be configured centrally. Any changes made to a VMD's properties are then updated and replicated automatically to all MASSs in the domain.</p> <p>Note:</p> <p>A subscriber requires security permissions to access VMSC.</p> <p>For more information about VMSC, see the Modular Messaging, Messaging Application Server administration guides, available on the <i>Avaya Modular Messaging Documentation</i> CD-ROM.</p>
Subscriber Administration and All Tasks Wizard	<p>For Microsoft Exchange subscribers, you can add, modify, or delete subscribers individually or in groups.</p> <p>For more information about managing subscribers, see the Modular Messaging, Messaging Application Server administration guides, available on the <i>Avaya Modular Messaging Documentation</i> CD-ROM.</p>

Table 3: Modular Messaging administration tools

Administration tool	Description
<p>Caller Applications Editor</p>	<p>Use the Caller Applications Editor, a software application that consists of Microsoft Management Console (MMC) snap-ins and extensions, to create Caller Applications. For more information on Caller Applications, see Caller Applications on page 59.</p> <p>Install the Caller Applications Editor on any computer, not necessarily an MAS. Caller Applications are saved as UMA files, which are often, though not necessarily, originated and initially stored on the computer that hosts the Editor.</p> <p>To make the application available to callers, administrators use the Caller Applications Editor and associate and deploy a copy of the UMA file to the MAS units in the VMD. This process is called deployment.</p> <p>Note:</p> <p>Depending on hardware, you can deploy up to 150 Caller Applications on a voice mail domain.</p> <p>Use the Editor to create one or more associations to specify the conditions under which a deployed caller application is launched for callers.</p> <p>Although anyone with access to a copy of the Caller Applications Editor can create a caller application and save that caller application to a file, only Modular Messaging system administrators can deploy applications and modify the associations.</p>
<p>Visual Voice Editor</p>	<p>Use the Visual Voice Editor, a software application, to customize the prompts for the Automated Attendant. The application provides a GUI for recording and editing prompts. Prompts are recorded using either the local multimedia capabilities on a personal computer or a telephone.</p> <p>For more information about Visual Voice Editor, see the Modular Messaging, Messaging Application Server administration guides, available on the <i>Avaya Modular Messaging Documentation</i> CD-ROM.</p>

[Table 4](#) describes the various Modular Messaging diagnostic and reporting tools.

Table 4: Modular Messaging diagnostic and reporting tools

Diagnostic and reporting tool	Description
Operation History Viewer	<p>Use the Operation History Viewer to view events stored in the Operation History Database, a temporary storage area for events generated by the voice mail system.</p> <p>For more information about the Operation History Viewer, see the Modular Messaging, Messaging Application Server administration guides, available on the <i>Avaya Modular Messaging Documentation</i> CD-ROM.</p>
Port Monitor	<p>Use the Port Monitor, a GUI based software application, to check and change the status of ports on a MAS.</p> <p>For more information about the Port Monitor, see the Modular Messaging, Messaging Application Server administration guides, available on the <i>Avaya Modular Messaging Documentation</i> CD-ROM.</p>
MMSnap Utility	<p>The MMSnap Utility collects and distributes fault data from MAS systems.</p>
Reporting Tool	<p>An administrator uses the Reporting Tool application to generate reports that summarize voice mail activity.</p> <p>For more information about Reporting Tool, see the Modular Messaging, Messaging Application Server administration guides, available on the <i>Avaya Modular Messaging Documentation</i> CD-ROM.</p>

MAS software

The MAS software, which provides the Alarming Server, along with Event, Fault, Performance, and Process Monitoring, is required on every MAS that handles calls.

Tracing Service

The Tracing Service records operational information about activity related to the MAS service of Modular Messaging. Events such as port activity are passed from the MAS units in the VMD and are stored in an Operation History Database. The Tracing Service maintains connections with all MAS units in a VMD and performs the following tasks:

- Collects all events generated by each MAS in a VMD that are used by an administrator for diagnostic purposes
- Writes the events to the Operation History Database

- Periodically extracts summary information for the entire VMD from the operation history database and writes it to the transaction database (optional)
- Periodically cleans up expired events from the operation history database and from the transaction database (optional)

Note:

Avaya strongly recommends that administrators should use Tracing Service to periodically clean up expired events from their Operation History Database. For more information on Operation History Database and cleaning up expired events, see the MAS Administration Guide.

Mailbox Monitor Service

The Mailbox Monitor Service monitors subscriber mailboxes to determine when a new message meets MWI and Call Me rules.

The MWI Service and Call Me Service communicate frequently with the Mailbox Monitor Service, so the supported Modular Messaging configuration requires that they must all be coresident on the same computer.

During installation of the Modular Messaging system, on installing the Call Me Service or the MWI Service, the Mailbox Monitor Service is automatically installed.

Message Waiting Indicator Service

The MWI Service alerts subscribers when messages meeting specified criteria arrive in their mailboxes. Subscribers are alerted, either by a lamp indicator on their telephone or by an audible tone, when they pick up the receiver. The MWI Service uses the Mailbox Monitor Service to check when new messages arrive and determines the indicator status on a subscriber's telephone.

The MWI Service performs the following tasks:

- Maintains a list of subscribers with active MWI rules and stores information about each subscriber mailbox that has MWI enabled
- Uses the Mailbox Monitor Service to periodically monitor subscriber mailboxes to determine when a new message meets MWI rules
- Requests any MAS in the VMD that is configured to provide MWI Service to set or reset MWI

For more information on MWI, see [Message Waiting Indicator](#) on page 222.

Call Me Service

With the Call Me Service, Modular Messaging initiates the Call Me and Notify Me features to notify subscribers when messages meeting specified criteria arrive in their mailboxes. The Call Me Service uses Mailbox Monitor Service for checking when new messages arrive.

Modular Messaging server components

The Call Me feature causes Modular Messaging to call subscribers at a designated telephone number or list of telephone numbers. The Notify Me feature causes Modular Messaging to send a text message to a designated address or initiate a paging call.

The Call Me Service performs the following tasks:

- Maintains a list of subscribers with active Call Me and/or Notify Me rules and stores information about each active rule
- Uses the Mailbox Monitor Service to periodically monitor subscriber mailboxes to determine whether a new message meets specified rules
- Requests that an MAS in the VMD use subscriber-configured telephone lists to call the subscriber, subject to Call Me rules
- Requests that a text message be sent to the subscriber-configured address

For more information on Call Me, see [Call Me](#) on page 225.

Fax Sender Service

Avaya MSS

Modular Messaging—MSS uses the Fax Sender Service to support fax messaging. The Fax Sender Service is applicable only to Modular Messaging—MSS systems.

Subscribers of Modular Messaging—MSS can receive, review, send, and print fax messages. When subscribers send a fax, the feature attaches a cover page to the fax message.

From the TUI, subscribers can send to a fax machine a fax or text message they have received. Using a desktop client, subscribers can also send text messages or Tag Image File Format (TIFF)/F Profile for Facsimile files created using Windows features to fax machines. To do this, subscribers send a message to the Fax Sender Service using a special fax address.

After receiving the message, the Fax Sender Service performs the following tasks:

1. Converts the text message to TIFF/F format.
2. Places an outgoing call to the fax machine.
3. Sends the fax.
4. Sends a message to the subscriber indicating whether the fax was successfully transmitted.

For more information, see [Modular Messaging—MSS native fax server](#) on page 194.

Note:

H.323 integrations currently do not support fax capabilities.

Data Collection Tool

The Avaya Modular Messaging Data Collection Tool (DCT) collects information that is required for an upgrade or catastrophic disk failure recovery of an MAS. The tool queries each MAS unit

in a VMD and the supplementary Tracing Service, if present, to collect the required information. The DCT puts the server information into a data file.

Modular Messaging uses the information in this data file during the upgrade of the MAS or to restore the MAS configuration after a catastrophic disk failure. For information on the requirements for installing the DCT on an MAS, see <Data Collection Tool requirements planning section>.

For more information on DCT, see Modular Messaging Data Collection Tool Online Help available on the *Avaya Modular Messaging Documentation* CD-ROM.

Web server

A Web server allows subscribers to obtain access to Modular Messaging Web Client and Web Subscriber Options. For Modular Messaging Web Client and Modular Messaging Web Subscriber Options, a Web server is a PC-based server running Windows Server software.

You can use a standalone computer or an MAS as a Web server. Modular Messaging Web Client must be installed on a standalone computer, as Modular Messaging Web Client cannot be installed on an MAS or with other MAS applications or services.

Web Subscriber Options can be installed on an MAS, on the Web server of Modular Messaging Web Client, or on a standalone computer. However, Web Subscriber Options or Web Client cannot be installed on a Supplementary Server. For information on Supplementary Server, see [Messaging application server load balancing](#) on page 350.

Note:

Avaya strongly recommends that virus protection software with the latest updates is installed on the Web server.

Offline Call Answer Store

An MAS caches all Call Answer messages in a local message store.

In a multi-MAS VMD, each MAS migrates copies of messages in its local message store to a remote Offline Call Answer Store. The Offline Call Answer Store contains copies of messages from all MAS units in a VMD.

For increased availability, Modular Messaging provides Call Answer services to callers, even if a message store is unreachable. Modular Messaging makes these offline Call Answer messages available to subscribers via the TUI.

The Offline Call Answer Store can reside on an MAS that has the required storage capacity or on a separate computer. For more information, see [Recommendations for Offline Call Answer Store](#) on page 356.

Note:

All the MAS units on the VMD must have the required permissions to access the Offline Call Answer Store.

Modular Messaging server components

The administrator of the Modular Messaging system can configure the location of the Offline Call Answer Store on the VMSC. If an invalid path or an empty path is configured as the location, the MAS units will not be able to connect to the Offline Call Answer Store.

An administrator can reconfigure the location of the Offline Call Answer Store to a new location. The Modular Messaging system moves all offline Call Answer messages within the retention period to the new location. All offline Call Answer messages in the old location are retained. The administrator can manually delete these messages, as required.

If the Offline Call Answer Store becomes unavailable, the Modular Messaging system temporarily disables the offline access of Call Answer messages. The offline access is enabled when the store becomes available again.

Distributing MAS software components

[Table 5](#) describes how MAS software components are enabled in a multi-MAS VMD. For information on which component should be enabled on which MAS, see [Recommended placement of server components](#) on page 352.

Table 5: MAS software components

Software component	Notes
<i>Components that are required on each MAS</i>	
Administration tools and diagnostic tools	—
Language packs	The same set of languages are installed on each MAS.
Server components that are required on every MAS that will handle calls These software components are not required on an MAS that does not handle calls, for example, a computer that has only the Tracing Service installed on it.	
MAS software	This software includes the Alarming Server.
Prompt files	One set is required for each MAS that is running the MAS software.
<i>Components that are enabled on any MAS</i> For large configurations, consider installing and enabling some components, including the Tracing Service, on a Supplementary Server. A Supplementary Server is a separate computer, other than an MAS. For more information, see Recommendations for Offline Call Answer Store on page 356 and Supplementary Server requirements on page 412.	
Tracing Service	Install this software on each MAS of the VMD. However, the software must be enabled only once for the VMD. Avaya recommends that the Tracing Service be enabled on a Supplementary Server or on an MAS different from the one that is hosting the Call Me Service and MWI Service.

Table 5: MAS software components (continued)

Software component	Notes
Mailbox Monitor Service	By default, this software is installed first if the Call Me Service or MWI Service is selected.
Call Me Service	<p>Install this software on each MAS of the VMD. However, the software must be enabled only once for the VMD. Includes the Mailbox Monitor Service.</p> <p>Avaya recommends that the Call Me Service and MWI Service software is enabled on the same MAS. These services must be coresident with the Mailbox Monitor Service. These services must be installed on the MAS with the smallest number of ports, if possible, or on the MAS with the second smallest number of ports if the Tracing Service is installed.</p>
Message Waiting Indicator Service	<p>Install this software on each MAS of the VMD. However, the software must be enabled only once for the VMD. Includes the Mailbox Monitor Service.</p> <p>Avaya recommends that the Call Me Service and MWI Service software is enabled on the same MAS. These services must be coresident with the Mailbox Monitor Service. These services must be installed on the MAS with the smallest number of ports, if possible, or on the MAS with the second smallest number of ports if the Tracing Service is installed.</p>
Fax Sender Service	Applicable only to Modular Messaging—MSS version.
Caller Applications Editor	Install Caller Applications Editor on any computer, not necessarily on an MAS.

The Mailbox Manager application: - If the corporate network has a dynamic host configuration protocol (DHCP) environment, install the Mailbox Manager application on a trusted server. This is applicable only to Modular Messaging—MSS systems.

Message store

A Modular Messaging—MSS system is a turnkey solution that uses an internal message store.

A Modular Messaging—Exchange system integrates with an existing Microsoft Exchange e-mail system, which acts as the message store.

A Modular Messaging—Domino system integrates with an existing IBM Lotus Domino e-mail system, which acts as the message store.

Functions of a message store

A message store provides or supports the following functions:

- Modular Messaging mailboxes for subscribers. These mailboxes store messages, including multimedia components such as voice, fax, text, and binary attachments. These mailboxes also store recorded greetings and certain other items of subscriber data.
- Message delivery to local mailboxes.
- Message networking for delivery of messages to remote destinations.
- Directory services, including mailbox account information.
- Desktop messaging clients.
- Directory synchronization with remote systems.
- Backup and restore of subscriber mailboxes.
- Distribution lists.
- Broadcast messages.
- Subscriber administration and system administration.

Avaya Message Storage Server

Avaya MSS

In Modular Messaging Release 3, all new installations of the MSS software reside on the Avaya S3500 platform with Red Hat Enterprise Linux (RHEL) Version 4.0 as the operating system. The MSS software of the upgraded Modular Messaging releases can reside on the Avaya S3400 platform with RHEL Version 4.0 as the operating system. IMAP4 is the communication protocol that other systems use to interact with the MSS. To manage attributes for Modular Messaging subscribers and Modular Messaging system data, the MSS uses an LDAP directory service.

The MSS is used for storing and administering subscriber mailboxes. The MSS stores all voice, fax, and text messages that a subscriber receives. The MSS does not have access to messages that were sent to the subscriber's mailbox on a separate corporate e-mail server.

The MSS is available in two configurations:

- MSS—S, the standard-availability configuration
- MSS—H, the high-availability configuration

For information on the capacities of the MSS—S and MSS—H, see [Avaya Message Storage Server capacities](#) on page 254.

For increased security, performance, control, and application management, the MSS is connected to the MAS through a private Ethernet local area network (LAN).

The MSS is designed so that it has no administratively activated offline mode.

Microsoft Exchange server

Microsoft Exchange

Modular Messaging supports the Microsoft Exchange Server 2007, Microsoft Exchange Server 2003, and Microsoft Exchange 2000 server.

For each Modular Messaging subscriber, the Microsoft Exchange server provides a single mailbox that holds all messages—voice, text, corporate e-mail, and fax—that the subscriber receives. To manage attributes for Modular Messaging subscribers and MAS units, Microsoft Exchange server uses Active Directory.

MAPI is the communication protocol that other systems use to interact with the Exchange server. Even though MAPI is not the default protocol of Microsoft Exchange Server 2007, it is a dependency of the product.

In Modular Messaging—Exchange (Microsoft Exchange Server 2007, Microsoft Exchange Server 2003, or Microsoft Exchange 2000 server environment), the directory server must be an Active Directory Domain controller configured as a global catalog. This server can be the same as the Exchange server, but it will typically be a separate server.

IBM Lotus Domino server

IBM Lotus Domino

Modular Messaging—Domino version supports the IBM Lotus Domino Server 7.0.x and IBM Lotus Domino Server 6.5.

**Important:**

Modular Messaging Release 2 and Release 3 do not support the IBM Lotus Domino message store. All information related to Modular Messaging—Domino is specific to Modular Messaging Release 1.1 and Release 3.1.

For each Modular Messaging subscriber, the IBM Lotus Domino server provides a single mailbox that holds all messages—voice, text, corporate e-mail, and fax—that the subscriber receives.

Notes RPC is the communication protocol that other systems use to interact with the IBM Lotus Domino server.

To manage attributes for Modular Messaging subscribers and MAS units, Domino uses the Domino Directory. In Modular Messaging—Domino version, the Directory runs on each IBM Lotus Domino server. This Directory manages addressing for IBM Lotus Domino and Modular Messaging subscribers.

Note:

Modular Messaging—Domino requires IBM Lotus Domino Unified Communications (DUC) 1.2.3.

Voice mail domain

A voice mail domain (VMD) is a group of MAS units with a common set of properties, that use one or more message stores. A VMD is a single, complete voice-messaging system.

The MAS units in a VMD can be seen as a single "virtual" server for that domain. This allows the system to be highly scalable, in that multiple servers can be configured as part of the VMD to address large capacity requirements. Modular Messaging—MSS supports a maximum of 5 MAS units and a single MSS in a VMD, while Modular Messaging—Exchange or Modular Messaging—Domino supports a maximum of 10 MAS units and multiple storage servers in a VMD.

An incoming call can land on any port on any card on any MAS to have access to Call Answering, greetings, messaging, fax receipt, auto attendant, Caller Applications, and the full directory.

Outbound services such as fax (MSS only), Call Me, and MWI can also share the communication facilities across all the servers. This virtual server allows Modular Messaging subscribers in the domain to use the TUI to call in, access their mailboxes, and retrieve their messages. Also, the virtual server can call the telephone of any subscriber who runs desktop client applications, such as Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, and Modular Messaging Lotus Notes Client, to play back voice messages.

Any changes made to the properties of a VMD are automatically updated and replicated to all MAS units in the domain. Voice mail domains provide the ability to store and retrieve properties that belong to a set of MAS units working together to provide integrated Call Answering.

An enterprise can create multiple voice mail domains, for example, one in each major geographical site.

All users within the VMD should share a common dialing plan. For additional information on designing voice mail domains, see [General rules for voice mail domains](#) on page 240.

Chapter 3: Modular Messaging interfaces

This chapter provides a description of the Avaya Modular Messaging interfaces that are available to subscribers and callers and an introduction to voice mail domains (VMDs).

This chapter includes the following topics:

- [Telephone user interfaces](#) on page 56
- [Graphical user interfaces](#) on page 70
- [Unified Communication Center Speech Access](#) on page 98
- [Administrative and management interfaces](#) on page 99

Note:

For information on Simple Network Management Protocol (SNMP), see [Simple Network Management Protocol with Modular Messaging](#) on page 119.

Telephone user interfaces

A telephone user interface (TUI) provides subscribers and callers with access to Modular Messaging, from a touchtone telephone.

The Modular Messaging TUI presents two interfaces:

- Caller interface
- Subscriber interface

Caller interface

Modular Messaging provides three different interfaces for callers:

- Automated Attendant
- Avaya Common Caller Interface (CCI)
- Caller Applications

The caller interface is for callers to the Modular Messaging system who either are not subscribers or have not logged in to the system as subscribers. Logged-in subscribers are presented the Subscriber Interface, also known as the Subscriber TUI.

Automated Attendant

Automated Attendant routes callers to their desired extension numbers when the called subscriber's telephone system does not support Direct Inward Dialing (DID).

Note:

A Modular Messaging system contains only one Automated Attendant. Administrators can use the Caller Applications for additional call routing requirements. For information on Caller Applications, see [Caller Applications](#) on page 59.

The Automated Attendant interface greets callers and guides them through the process of entering the extension number of the called subscriber. Administrators can configure Automated Attendant to allow callers to identify the called subscriber by spelling the name using touchtone keys.

The Automated Attendant interface also allows callers to reach designated system operators, also known as the covering extension, provided that an active schedule exists for the covering extension.

Avaya recommends that administrators set up the system to use Automated Attendant if the telephone system does not support DID. The Automated Attendant interface is enabled by default.

If Automated Attendant is disabled, the following Call Answering functionalities will not be available:

- Call Screening
- Call Blocking
- Find Me

Note:

When Automated Attendant is disabled, the Find Me capability is available for CCI calls that directly reach the subscriber extension.

Scheduling capabilities of Automated Attendant

Administrators can configure the Automated Attendant interface to exhibit scheduled behavior with respect to the prompts that callers hear when connecting to the system.

The Voice Mail System Configuration (VMSC) tool on the messaging application server (MAS) can be used for the first level of configuration, which relates to recurrent daily behavior. For each day of the week, the hours in which the office is open can be specified, and the prompts to be played during those specific hours can be configured. These prompts greet callers during designated business hours.

Administrators can also set holiday schedules for Automated Attendant, which override any recurrent daily behavior that may be defined. The Automated Attendant Holiday prompts can be configured to play on specific dates, for example, when the office is closed for a public holiday.

The system supports up to 18 holiday prompts for a VMD.

Avaya Common Caller Interface

Callers who reach the mailbox of a subscriber, either because the extension is busy or because there is no response, are prompted to leave a message for the subscriber. Messages that the caller leaves for a subscriber are known as Call Answer messages.

Typically, the caller hears a greeting for the mailbox and is prompted to leave a message for the called subscriber. The caller may record a message and hang up.

The interface that allows callers to leave Call Answer messages is identified as CCI. This interface allows the Call Answer callers limited interactions with the messaging system through a set of touchtone commands. These commands are common for all Call Answer callers, regardless of the TUI assigned to the called subscriber.

Note:

Callers are also presented with the CCI if the system setup does not support supervised transfer.

Options available when using the Common Caller Interface

When a caller reaches a subscriber's mailbox and is presented with the CCI, the CCI plays the options the caller can use to leave a message for the called subscriber.

Note:

If a Caller Application is associated with a called extension and the call is then redirected to the TUI, the Caller Application is executed instead of the default CCI call handling.

When presented with the CCI, callers can do the following:

- Select the language in which the Call Answer announcements are made, if multiple languages have been assigned by the subscriber.
- Listen to the active greeting.
- Listen to the instructions for recording messages.
- Record and send a voice message or send a fax message. Modular Messaging—Avaya Message Storage Server (MSS) subscribers can also send a fax message with voice annotations.
- Set delivery options and send the message. Delivery options include marking a message urgent, marking a message private, and including a fax message.

Note:

An MAS administrative setting determines if callers can leave private Call Answer messages. For more information, see [Creating private Call Answer messages](#) on page 147.

- Exit from the CCI.
- Transfer the call to the system operator.
- Log in to a mailbox.
- Transfer to another mailbox.

For more information on using the CCI, see the *Avaya Modular Messaging Release 3 Telephone User Interface Guide*.

Selecting a language when leaving a Call Answer message

The subscriber can define a default Call Answer language and one or two additional languages for the mailbox by using Subscriber Options or Web Subscriber Options. The languages may be any of those installed on the Modular Messaging system. Teletypewriter (TTY) can be one of the Call Answer languages. If TTY is enabled for the Modular Messaging system, the caller can toggle between TTY and a spoken language by dialling '*1' on the telephone keypad.

Note:

Subscribers may define TTY as the default language if they expect to receive calls from persons using TTY devices for the hearing impaired. This setting will allow any caller to leave a message using a TTY device. This capability provides compliance with Sections 508 and Section 255 of the United States federal regulations regarding system access by persons with hearing impairments.

When the caller reaches a mailbox with multiple Call Answer languages, the caller will be prompted to select one of the languages for all subsequent system prompts and announcements. If the caller does not specify a choice, the default language will be used.

For more information on selecting a language, the see *Avaya Modular Messaging Release 3 Telephone User Interface Guide*.

Caller Applications

Caller Applications are a collection of menus and prompts that allow administrators to extend those parts of the Modular Messaging TUI that are accessible to callers.

Using Caller Applications, administrators can extend the system Automated Attendant and the CCI, depending on the requirements of the organization.

Some basic functions that a Caller Application can provide include:

- Transferring callers to a specified mailbox
- Allowing callers to record messages
- Sending messages to either a mailbox number or an e-mail address that is configured as part of the Caller Application
- Providing directory assistance for callers to use the dial-by-name functionality of the TUI

Caller Applications can perform additional functions, such as:

- Automating call handling and routing incoming calls directly to departments within the organization
- Creating daily bulletin board announcements for callers and subscribers
- Allowing greater flexibility and more options for system and personal greetings

Note:

Caller Applications are created using the Caller Applications Editor. For more information, see [Caller Applications Editor](#) on page 43.

Difference between a Caller Application and an Aria mailbox type

The Octel 250/350 series of voice mail systems allows extensive customization of the TUI through the use of Enhanced Call Processing (ECP) mailboxes and other types of mailboxes.

A Caller Application is not a mailbox and does not require that a mailbox be created on the message store or be dedicated to its use. A Caller Application contains one or more nodes,

each of which can interact with the caller and pass control to another node. The actions that a particular node performs will correspond in many cases to actions performed by a certain Aria mailbox type.

Caller Applications do not emulate all Aria mailbox types. A Caller Application can be considered as a single-digit menu or as nested Automated Attendants, comprising a collection of actions of the various types supported, including:

- Menu (simple, or with extension, mailbox, or Caller Application)
- Transfer (operator, extension, or mailbox)
- Goto
- Conditional goto
- Send message (to mailbox or e-mail address)
- Termination (disconnection, default Automated Attendant, or to mailbox logon)

These actions can be combined as required to produce useful applications. Enough flexibility exists to duplicate, or at least approximate, the functionality of certain Aria mailbox types.

Scheduling capabilities of Caller Applications

Caller Applications provide scheduling capabilities that determine the behavior of Caller Applications, depending on the time of day. The Caller Application routes callers as per the definitions of the schedule created for a conditional branch within the application.

For example, a schedule can be created so that:

- When the schedule is active, callers are transferred to live help.
- When the schedule is inactive, callers are transferred to a mailbox, where they can record a message.

Caller Applications allow administrators to specify the hours in a week during which the schedule is active.

In addition to setting daily and hourly behavior, administrators can specify the behavior of Caller Applications for system-defined holidays. The Caller Applications Holiday prompts can be configured to play on specific dates, for example, when the office is closed for a public holiday.

For more information, see *Avaya Modular Messaging Caller Applications*, EF-MES2141-01, available in the Messaging White Papers Resource Library on the Avaya Web site (<http://www.avaya.com>).

Subscriber interface

The subscriber interface interacts with authenticated subscribers, providing them with access to mailboxes, from a touchtone telephone or a TTY device. When subscribers are away from the office, they can dial into their mailboxes from the TUI to check their messages.

Modular Messaging Release 3 and later provide the following TUIs:

- Aria TUI for Modular Messaging, an Octel Aria-based TUI
- AUDIX TUI for Modular Messaging, a TUI option that is similar to the TUI of Intuity AUDIX and DEFINITY AUDIX voice-messaging systems
- Serenade TUI for Modular Messaging, an Octel Serenade-based TUI

Administrators can assign subscribers the TUI of their preference, on a class-of-service (COS) basis.

The Modular Messaging TUIs make it easier for organizations to migrate from the following systems:

- An Aria (Octel 250/350) system to a Modular Messaging—MSS (Release 3 or later) system
- An Intuity AUDIX voice messaging system or a DEFINITY AUDIX system to a Modular Messaging—MSS (Release 3 or later) system
- A Serenade (Octel 200/300) system to a Modular Messaging—MSS (Release 3 or later) system



Important:

The Modular Messaging TUIs are similar to but not exactly the same as the respective traditional Aria, Intuity AUDIX, and Serenade messaging systems.

Modular Messaging provides some interfaces that are common to all its subscribers, regardless of their assigned TUIs. Modular Messaging also provides callers trying to leave a message with a common caller interface and set of prompts, regardless of the TUI that is assigned to the target mailbox.

Common subscriber log-in interface

Subscribers can directly dial the Modular Messaging system to log in to their mailboxes from their extensions or from other telephones.

All Modular Messaging subscribers use the same interface up to the point of logging in to their mailboxes.

When subscribers dial the access number, they are greeted by the system Automated Attendant. The Automated Attendant announces the options a subscriber must use to reach a mailbox. Depending on whether the extension that the subscriber is using has an associated mailbox on the system, the Automated Attendant prompts the subscriber for either the password or the mailbox number and password.

If Automated Attendant is not enabled, the system transfers callers directly to the mailbox of the called subscriber. The caller can then leave a message for the subscriber.

Subscribers can also log in to their mailboxes from a TTY device with an acoustic coupler. The TTY device converts the announcements of the Automated Attendant to character prompts, which are displayed on the LED of the TTY device. Subscribers can then enter their response to

Modular Messaging interfaces

the TTY prompt by using either the telephone or the TTY device. All touchtone inputs can be made by using the telephone and all other inputs, such as the message to be recorded, can be entered by using the TTY device. The TTY device converts all subscriber responses to TTY tones. The Modular Messaging system records the TTY tones in the same way as messages spoken over the telephone are recorded.

Common Offline Access interface

When an MAS is operating in offline mode, subscribers can access the Call Answer messages they have received, using a common interface, regardless of the TUI assigned to them. Using the Common Offline Access interface, subscribers can access the following Call Answer messages:

- New Call Answer messages recorded after the MAS has gone into offline mode
- New Call Answer messages recorded before the MAS has switched to offline mode but that are within the configured retention period even if they have since been deleted from the subscriber's mailbox

Subscribers can gain access to only Call Answer messages through the Common Offline Access interface. They cannot access the new mail messages that are delivered to their mailboxes. Offline access of Call Answer Messages allows subscribers only to listen to the messages. The subscribers cannot delete, save, or respond to the messages. For more information on the offline access to Call Answer messages, see [Offline access to Call Answer messages](#) on page 169.

Common Call Me interface

The Call Me feature allows the subscribers to schedule calls to one or more designated telephone numbers when messages that meet certain criteria arrive in their mailbox. When subscribers answer a Call Me call, they are invited to log in to Modular Messaging to review the message or messages.

All Modular Messaging subscribers use a common interface when answering Call Me calls. This interface identifies the called subscriber and provides a set of instructions for performing the following operations:

- Logging in to the mailbox by entering the mailbox number and password. After a subscriber logs in, the TUI assigned to the subscriber is used.
- Receiving the call.
- Canceling further notifications for the current messages. This option deactivates Call Me for only the current messages. Call Me continues to remain active for the next new message.
- Blocking all further calls to the called number by turning off the associated Call Me rule. This option cancels all further calls to the called number or any other number that is configured for the rule. If a subscriber enters a wrong Call Me number while answering a

Call Me call, the receiver of the call can select the option to stop the nuisance calls. The subscriber can use Subscriber Options to re-activate Call Me.

Features of the subscriber interface

Using the TUIs, subscribers can do the following:

- Initialize their mailboxes. When subscribers log in to their mailboxes for the first time, the Mailbox Initialization feature guides subscribers through the process of changing their password and recording their spoken name. In addition, subscribers of the Modular Messaging Aria TUI can record their Please Hold prompt and personal greetings from the initialization feature.
- Retrieve, respond to, create, and send messages. The TUIs provide subscribers with an easy way to record, send, reply to, or forward messages.
- Access and respond to voice, fax, and text messages.

In addition, Modular Messaging—Microsoft Exchange and Modular Messaging—IBM Lotus Domino subscribers can access and respond to corporate e-mail messages as well. The text-to-speech (TTS) feature converts corporate e-mail messages to speech, so that subscribers can listen to them as conveniently as they can to voice messages.

- Reply to a Call Answer message, and call the originator of a Call Answer message if the originator is a local or remote Modular Messaging subscriber.

Note:

To reply to a Call Answer message from a remote subscriber, an administrator needs to perform some administrative tasks on the Modular Messaging system for Call Answer responses. For information on administering a Modular Messaging system for Call Answer responses, see [Administering Modular Messaging systems for Call Answer responses](#) on page 183.

- Call the extension of the sender.
- Access offline Call Answer messages. When the message store is not available, Modular Messaging continues to provide Call Answer services. From the TUIs, subscribers can gain access to offline Call Answer messages. For more information, see [Offline access to Call Answer messages](#) on page 169.
- Access private messages. Subscribers can access private messages from the TUIs. Depending on the Privacy Enforcement Level setting administered for the system, the TUIs might restrict subscribers from forwarding the message and replying to the private message with the original attached. For more information on the Privacy Enforcement Level setting, see [The Privacy Enforcement Level parameter](#) on page 148.
- Create private messages. Subscribers can mark new messages as private.
- Access personal configuration options. Subscribers can set up call handling and customize greetings.

Note:

Certain personal configuration options cannot be modified using a TUI, such as specifying notification rules for Notify Me. These may be modified using Subscriber Options or Web Subscriber Options.

- Create, modify, and delete Personal Distribution Lists (PDLs).
- Address messages to PDLs using the PDL Name or the PDL List number.
- Record announcements that will be played in the Caller Applications.
- Sort messages by message type. Subscribers of Modular Messaging AUDIX TUI and Modular Messaging Serenade TUI can sort messages by message type. Subscribers of Modular Messaging Aria TUI do not need to sort their messages by message type since the TUI provides separate queues for each message type.

Note:

Subscribers of Modular Messaging AUDIX TUI and Modular Messaging Serenade TUI can configure the sort by message type feature only through Subscriber Options and Web Subscriber Options.

- Configure Personal Operator: Subscribers can assign a mailbox number or extension number as the personal operator and select a schedule for the personal operator.

Note:

Subscribers can configure personal operators for their mailboxes only if the administrator has assigned the required permissions to the subscribers. When using the TUIs, subscribers can select personal operator schedules but cannot view them. To view schedules, subscribers must use Subscriber Options or Web Subscriber Options.

If the configured personal operator number corresponds to a mailbox number then the time zone assigned to the personal operator's mailbox will be used for the associated schedule. Otherwise, the subscriber's time zone will be used.

- Access unsent voice messages: If the telephone call drops when a subscriber is composing a voice message, the TUI saves the unsent message in the Drafts folder. During the subscriber's next log in to the TUI, the subscriber is presented with unsent messages, if any. The subscriber can either complete and send the message, delete the message, or skip the message for later access. For more information on messages in the Drafts messages category, see [Draft messages](#) on page 66.

Common mailbox model

Modular Messaging provides a mailbox model that is common to subscribers of all three Modular Messaging TUIs.

A common mailbox model includes:

- Common message categories

- Common Message Waiting Indicator (MWI) status
- Common Call Answer greetings
- Common Audible Hourglass prompt

Message categories

Modular Messaging messages are stored in four message categories: New, Saved, Deleted, and Draft. The New, Saved and Deleted categories are consistent with standards-based e-mail clients and are also common to the Modular Messaging TUIs. The Draft category is new for Modular Messaging—MSS. Modular Messaging—Exchange and Modular Messaging—Domino store the messages in the standard Drafts folder. For all Modular Messaging systems, Draft messages can be accessed with the Modular Messaging TUIs.

Note:

Modular Messaging Web Client supports an additional message category, Admin. In this category, messages that indicate delivery failures or other system or server problems are stored.

New messages

Messages that are received in a subscriber mailbox are stored in the New message category when they meet any of the following criteria:

- The subscriber has not listened to or viewed the contents of the message, also known as the message body. The subscriber might or might not have accessed the envelope or header information of the message.
- The subscriber has accessed the message body and has used the available TUI options to explicitly retain the message as New.
- The subscriber has moved the message from the Saved category back to the New category.
- The subscriber has marked read messages as unread, from graphical user interface (GUI) clients.

The Modular Messaging TUIs present these messages as New messages. Standards-based e-mail clients might present these messages as New, Unseen, and Unread.

Saved messages

Messages that are received in a subscriber mailbox are stored in the Saved message category when they meet either of the following criteria:

- AUDIX and Serenade TUIs for Modular Messaging. The subscriber has accessed the contents of the message. The subscriber might have accessed the whole message or might have partially accessed the message.
- Aria TUI for Modular Messaging. The subscriber has accessed the message and has used the available TUI option to save the message.

Modular Messaging interfaces

The Modular Messaging TUIs present these messages as Saved messages. Standards-based e-mail clients might present these messages as Old, Seen, and Read.

When using Modular Messaging Outlook Client or Modular Messaging Lotus Notes Client, Modular Messaging—MSS subscribers can mark read messages as unread, thus moving messages from the Saved category to the New category.

When subscribers move messages from the Saved category to the New category, the system activates or deactivates the following features:

- **MWI.** The system activates MWI for the moved message if the message meets the subscriber-defined MWI rule. Broadcast messages that are moved to the New category do not activate MWI.
- **Call Me.** The system activates Call Me for the moved message only if the delivery time of the message is after the time that the subscriber last logged in from the TUI.
- **Notify Me.** The system does not activate Notify Me for the moved message, as Notify Me is currently triggered only during Call Answer.

Deleted messages

Messages that are deleted by a subscriber are stored in the Deleted message category. These messages are accessible through the Modular Messaging Aria TUI, Modular Messaging Serenade TUI, and the Modular Messaging GUIs. Subscribers cannot access these messages through the Modular Messaging AUDIX TUI.

Draft messages

If the telephone call drops when a subscriber is composing a voice message, the unsent voice message is saved in the Drafts message category.

Note:

A TUI will save the unsent voice messages of a subscriber in the Drafts message category only if the administrator has enabled the feature for the subscriber. The administrator can use a class-of-service (COS) setting to determine whether the subscriber is permitted to use the feature or not.

When the subscriber logs into the mailbox using the TUI and there are unsent messages saved in the Drafts message category, the TUI presents the unsent messages to the subscriber. The subscriber can perform any one of the following actions on the messages:

- **Edit the messages, address the messages, and send the messages.** When the messages are sent, the TUI removes the unfinished copy of the messages from the Drafts message category.
- **Delete the messages.** When the messages are deleted, the TUI removes the messages from the Drafts message category.
- **Skip the messages.** When the messages are skipped, the TUI retains them in the Drafts message category. During the next log on, the TUI again presents the messages to the subscriber.

- Exit to the main TUI menu, skipping any remaining unsent messages.

If a subscriber edits a voice message saved in the Drafts message category and the telephone call drops again, the TUI replaces the old unsent message with the new edited version of the unsent message.

Message Waiting Indicator status

The Modular Messaging TUIs behave in a common fashion when activating and deactivating the MWI feature.

Note:

Broadcast messages do not activate MWI.

New messages

When the mailbox of a subscriber has one or more new messages, the system activates MWI, provided that the new messages meet the subscriber-defined MWI rules. When subscribers access a message and use a TUI option to retain the message in the New message category or when subscribers move a message from the Saved category to the New category, the system activates MWI.

Saved messages

Messages in the Saved category do not activate MWI.

Deleted messages

Messages in the Deleted category do not activate MWI.

Call Answer greetings

Subscribers can set up the Modular Messaging TUIs to play personalized greetings to callers.

Note:

If a called extension is associated with a Caller Application and the call is redirected to the TUI, the Caller Application is executed instead of the default CCI call handling. In this case, when callers reach a subscriber mailbox, they hear the menus or announcements of the Caller Application instead of the subscriber greeting.

The Modular Messaging TUIs support the following types of greetings:

- Personal greeting

Subscribers can use this greeting to greet all callers that reach their mailboxes.

- Extended Absence Greeting (EAG)

Subscribers can use the EAG to inform a caller that they are away from the office and have infrequent or no access to their messages. Callers cannot dial-through an EAG.

- Optional greetings

Modular Messaging provides two optional greetings: Optional Greeting 1 and Optional Greeting 2. Subscribers can use these optional greetings to administer a call type, also known as Call Handling. With Call Handling, subscribers can administer the system to differentiate between calls that reach a mailbox because an extension is busy (Busy calls) or because there is no answer (No Answer calls). Subscribers can decide which optional greeting to activate for Busy calls and No Answer calls. The two optional greetings are also available when the Automated Attendant overrides Call Handling.

Modular Messaging can differentiate between Busy calls and No Answer calls only if the telephone system provides this information for Call Answer calls.

Note:

The Call Handling feature is handled differently, depending on your TUI. For more information on call types and call handling, see the *Avaya Modular Messaging Release 3 Telephone User Interface Guide*.

Audible Hourglass prompt

When the system response to a subscriber-requested operation is delayed for more than four seconds, the system plays an Audible Hourglass prompt. This prompt is an audible indication to subscribers that work is in progress and they should continue to wait.

The Audible Hourglass prompt is the Please Wait prompt or an appropriately localized equivalent, which is repeatedly played to the subscriber at 8-second intervals. Playback of the prompt will be cancelled as soon as a response to the subscriber-requested operation is received. When a response is received, the system plays the Audible Hourglass prompt completely and then after a pause plays the subsequent prompt.

If the system does not respond within 30 seconds, the "The system is experiencing difficulties. Please hang up and try again later." prompt or an appropriately localized equivalent prompt is played.

Multilingual support

Administrators can configure the system so that the Modular Messaging TUIs support multiple languages.

Multilingual support for subscriber login: Administrators can identify one language as the default language for the system. The TUIs play all announcements and prompts in this language, unless otherwise instructed.

The prompts that a subscriber hears when logging in to the system are played in the default language of the system, up to the point of logging in. Once the subscriber successfully logs in to the mailbox, all subsequent prompts are played in the language administered for the mailbox.

Multilingual support for Automated Attendant: Administrators can assign up to three languages to the Automated Attendant. TTY can be assigned as one of the languages.

When the Automated Attendant greets callers, callers can select the language they prefer. All subsequent prompts and announcements from the Automated Attendant and Caller Applications during that call are played in the selected language. Callers calling from TTY devices can select TTY/Telecommunications Device for the Deaf (TDD) as a language.

Multilingual support for Call Answer: Subscribers can configure their mailbox to support either multiple languages or a single language. If a mailbox is multilingual, Subscriber Options and Web Subscriber Options allow subscribers to assign up to three languages—primary, secondary, and tertiary—to their mailbox. TTY is assigned as one of the languages. The language selected for the mailbox is used for Call Answer sessions.

When callers reach the subscriber mailbox, they are given the opportunity to select a language, provided multiple languages are assigned to the subscriber mailbox. All subsequent prompts and announcements during that Call Answer session are played in the selected language. If only one language is defined for the subscriber mailbox, the primary Call Answer language is used for the duration of the Call Answer session.

Multilingual support for TUIs: Subscriber Options and Web Subscriber Options allow subscribers to select their preferred TUI language for their mailbox, out of nine maximum languages loaded on the system. The TUI language selected for the mailbox is used for logged in messaging sessions and not for Call Answer sessions. TTY can be assigned as the preferred TUI language. All TUI prompts are played in the selected language. If subscribers do not specify a language, the system uses the default language.

Multilingual support for Caller Applications: A Caller Application can interact with callers in different languages.

A Caller Application runs in the default TUI language for the VMD, unless a caller has previously interacted with the Automated Attendant and has chosen a different language.

When a multilingual Caller Application replaces the system Automated Attendant, only the default TUI language defined for the VMD is played to callers, provided this language exists in the Caller Application. Callers are not provided with an opportunity to choose a language before the Caller Application starts to run. However, Caller Applications can be modified to offer callers a choice of languages by providing a suitable interface. One way to do this is to create a Caller Application that collects the caller's choice of language and that branches to other Caller Applications according to their choice.

For more information, see *Avaya Modular Messaging Caller Applications*, EF-MES2141-01, available in the Messaging White Papers Resource Library on the Avaya Web site (<http://www.avaya.com>).

Graphical user interfaces

Depending on the system Privacy Enforcement Level setting, Modular Messaging subscribers can use GUIs, such as Avaya GUI clients or standards-based clients to access their mailboxes. GUI clients are applications that allow subscribers to access their mailboxes from a desktop computer. These applications provide subscribers with a visual interface to perform various operations, such as accessing and sending messages, managing messages, configuring mailboxes, and maintaining mailboxes, rules, greetings, and TUI and GUI preferences.

For more information on the Privacy Enforcement Level setting and its impact on GUI access to mailboxes, see [The Privacy Enforcement Level parameter](#) on page 148.

Modular Messaging subscribers use the following GUIs to access their mailboxes:

- GUIs for Modular Messaging—MSS subscribers
 - Modular Messaging Microsoft Outlook Client. The Modular Messaging Outlook Client creates a new inbox for Modular Messaging messages, separate from the corporate e-mail inbox. Subscribers can access, send, and manage messages from this new inbox, from within the Microsoft Outlook e-mail application. For more information, see [Modular Messaging Microsoft Outlook Client](#) on page 72.
 - Modular Messaging Microsoft Restricted Outlook Client. The Modular Messaging Restricted Outlook Client creates a new inbox for Modular Messaging messages, separate from the corporate e-mail inbox. Subscribers can access, send, and manage messages from this new inbox, from within the Microsoft Outlook e-mail application. The client also creates a separate outbox for Modular Messaging voice messages, separate from the corporate e-mail outbox. Voice messages that subscribers intend to send are temporarily stored in the new outbox. For more information, see [Modular Messaging Microsoft Restricted Outlook Client](#) on page 77.
 - Modular Messaging IBM Lotus Notes Client. The Modular Messaging Lotus Notes Client creates a new inbox for Modular Messaging messages, separate from the corporate e-mail inbox. Subscribers can access, send, and manage messages from this new inbox, from within the IBM Lotus Notes e-mail application. For more information, see [Modular Messaging IBM Lotus Notes Client](#) on page 84.
 - Modular Messaging Web Client. This Avaya client allows subscribers to access, send, and manage voice, text, fax, and corporate e-mail messages from a Web browser. Modular Messaging Web Client cannot be used for mailbox configuration. For mailbox administration functions, subscribers can use the TUIs or Subscriber Options. For more information, see [Modular Messaging Web Client](#) on page 93.
 - Standards-based clients. Subscribers can use Internet Messaging Access Protocol 4 (IMAP4) and Post Office Protocol 3 (POP3) clients for message access. Standards-based clients cannot be used for mailbox configuration. For mailbox administration functions, subscribers can use the TUIs or Subscriber Options. For more information, see [Standards-based clients with Modular Messaging—MSS](#) on page 96.

- Subscriber Options. An application that subscribers can use to modify their mailbox settings from a desktop computer. With Modular Messaging—MSS, Subscriber Options integrates with the Microsoft Outlook or the IBM Lotus Notes e-mail client. Subscriber Options also works as a stand-alone application for subscribers who do not use IMAP4 access or who do not use the Microsoft Outlook or the IBM Lotus Notes e-mail client. For more information, see [Subscriber Options](#) on page 87.
- Web Subscriber Options. An application that subscribers can use to modify their mailbox settings from a Web browser. Web Subscriber Options provides all functionality that Subscriber Options provides, through the Web browser. For more information, see [Web Subscriber Options](#) on page 89.
- GUIs for Modular Messaging—Exchange subscribers
 - Modular Messaging Microsoft Outlook Client. The Modular Messaging Outlook Client allows subscribers to receive voice mail in their existing e-mail inbox. Just as they can with e-mail, subscribers can access, send, and manage voice mail from within the Microsoft Outlook e-mail application. For more information, see [Modular Messaging Microsoft Outlook Client](#) on page 72.
 - Outlook Web Access (OWA). This Web client provides subscribers with a single interface for access to voice mail and corporate e-mail messages stored in a common inbox on the Microsoft Exchange message store. OWA provides the ability to listen to messages but does not provide recording capabilities for replying with voice or composing new voice messages.
 - Subscriber Options. An application that subscribers can use to modify their mailbox settings from a desktop computer. With Modular Messaging—Exchange, Subscriber Options integrates with the Microsoft Outlook e-mail client. Subscriber Options also works as a stand-alone application for subscribers who do not use the Microsoft Outlook e-mail client. For more information, see [Subscriber Options](#) on page 87.
 - Web Subscriber Options. An application that subscribers can use to modify their mailbox settings from a Web browser. Web Subscriber Options provides all functionality that Subscriber Options provides, through the Web browser. For more information, see [Web Subscriber Options](#) on page 89.
 - Any other e-mail client that Microsoft Exchange supports.
- GUIs for Modular Messaging—Domino subscribers
 - IBM Lotus Domino Unified Communications (DUC) with IBM Lotus Notes. Subscribers can integrate IBM Lotus DUC software with their IBM Lotus Notes client. When DUC is installed with Modular Messaging—Domino, subscribers can use their IBM Lotus Notes e-mail client for access to voice mail and corporate e-mail messages.
 - iNotes. Also known as IBM Lotus Domino Web Access, iNotes is a Web client that subscribers can use to access their mailbox on the IBM Lotus Domino store. iNotes provides subscribers with a single interface for access to voice mail and corporate e-mail messages stored on the IBM Lotus Domino message store. iNotes provides listen and record capabilities to facilitate replying and composing messages with voice.

- Subscriber Options. With Modular Messaging—Domino, Subscriber Options can be installed either by installing the DUC application or by installing Subscriber Options as a standalone application. For more information, see [Subscriber Options](#) on page 87.
- Any other e-mail client that IBM Lotus Domino supports.

Modular Messaging Microsoft Outlook Client

Modular Messaging Outlook Client is an application that integrates with the Microsoft Outlook program and provides subscribers with access to mailboxes.

The application allows subscribers to create new voice messages, reply to any message type with a voice message, and forward any message type with a voice message—all from within the Microsoft Outlook e-mail client application.

Note:

Modular Messaging—Domino does not support Modular Messaging Outlook Client.

Modular Messaging—MSS

Avaya MSS

Modular Messaging Outlook Client provides subscribers with an integrated view of their messages, with voice and fax messages in the Modular Messaging inbox, which is separate from the corporate inbox.

The Modular Messaging inbox stores voice, text, and fax messages. In the Modular Messaging inbox, various message types are differentiated by specialized icons. Subscribers can use Modular Messaging Outlook Client to send, review, forward, and reply to messages from within Outlook.

Modular Messaging Outlook Client enables subscribers to create and to access private messages under suitable administration of the privacy settings.

Subscribers can keep copies of messages that the Modular Messaging inbox receives. Subscribers can copy messages from the Modular Messaging inbox to other folders, such as a folder in the corporate inbox or on the desktop. However, subscribers cannot copy messages from other folders or inboxes into the Modular Messaging inbox.

When subscribers use Modular Messaging Outlook Client to retrieve voice messages, they can either locally play the message on the computer or on the telephone. With Modular Messaging—MSS, when subscribers play messages on the telephone, the audio content is streamed from the MSS to the client and then to an MAS for playback over the telephone. Because of this double transfer, Modular Messaging Outlook Client is not recommended for playing messages remotely by means of the telephone.

Modular Messaging—Exchange

Microsoft Exchange

Modular Messaging Outlook Client provides subscribers a unified view of all their voice mail, text, corporate e-mail, and fax messages. Voice messages are stored in the same inbox that receives corporate e-mail messages and are differentiated by an icon. Subscribers can use Modular Messaging Outlook Client to send, review, forward, and reply to voice mail, fax messages, text messages, and corporate e-mails from within Outlook.

With Modular Messaging—Exchange, when Modular Messaging Outlook Client subscribers play a voice message on the telephone, the message is not transferred to the client. The connection rate from the client to the MAS does not affect responsiveness. For example, if a subscriber uses a dial-up connection to play a voice message and has two telephones available, a message played on the telephone is likely to provide much better responsiveness than local play.

Modular Messaging Outlook Client components

Modular Messaging Outlook Client provides the following tools:

- Modular Messaging Voice Form. For more information, see [Voice Form](#) on page 73.
- Modular Messaging Voice Recorder. For more information, see [Voice Recorder](#) on page 75.
- Service Providers (Modular Messaging—MSS). For more information, see [Service Providers \(Modular Messaging—MSS\)](#) on page 75.
- Subscriber Options (Voice Mail tab). For more information, see [Subscriber Options](#) on page 87.

Voice Form

The Voice Form allows subscribers to review, record, and send voice messages from Microsoft Outlook. The Voice Form includes a voice control that can be used to create and play voice messages by using either a telephone or local multimedia. The voice control provides familiar audio controls, such as, pause, stop, skip ahead, and skip back. When subscribers play multipart voice content, such as voice messages forwarded with voice comments, the voice control presents the message as a single audio stream.

Subscribers can use the Voice Form to address messages to PDLs (MSS version) and global distribution lists (Exchange version).

For more information on addressing messages to PDLs, see [Addressing from GUI clients](#) on page 142.

The Voice Form provides the following features:

- Directory access for addressing message recipients. With Modular Messaging—MSS, the Voice Form also provides directory access for addressing messages to PDLs.

With Modular Messaging—MSS, the Voice Form provides access to the MSS directory. The MSS directory includes the Modular Messaging Global Address List, the Modular Messaging PDL, and Personal Contacts.

With Modular Messaging—Exchange, the Voice Form provides access to the Global Address List and Personal Contacts.

- User preferences

Using the Voice Form, subscribers can set user preferences such as:

- Automatic playback of voice messages
- Request for notification of voice messages that are delivered and opened (Modular Messaging—Exchange version only)
- Request for read receipt of all new voice messages sent (Modular Messaging—Exchange version only)

- Message sensitivity and importance

The Voice Form enables subscribers to set sensitivity and importance on a per-message basis.

- Message comment (Modular Messaging—Exchange only)

Using the Voice Form, subscribers can attach text comments to a voice message (new or opened). Modular Messaging—MSS does not support this feature. Subscribers can use message comments as search criteria, thus making it easier to locate specific messages.

- Message subject

The Voice Form permits subscribers to add a subject when creating a new message or when replying to or forwarding a message. The message subject makes it easier for recipients to refer to messages when using a GUI client or scanning via the TUI. With Modular Messaging—MSS and Modular Messaging—Exchange, the Voice Form also enables subscribers to edit text subjects of messages they have received.

Subscribers can use message subjects as search criteria, thus making it easier to locate specific messages.

- Message privacy

The Voice Form permits subscribers to create private messages. In Modular Messaging—MSS, depending on the system Privacy Enforcement Level setting and the Restrict Client Access COS value, the Voice Form also enables subscribers to access private messages. However, the Voice Form does not restrict forwarding or saving private messages or replying to private messages with the original message attached. In Modular Messaging—Exchange, the Voice Form enables subscribers to access private messages depending on the system Privacy Enforcement Level setting.

Voice Recorder

Subscribers can use the Voice Recorder to record and send voice mail and voice-annotated items without having to start the Microsoft Outlook e-mail application. This tool works independently from the Voice Form.

Note:

When subscribers send messages, the Voice Recorder relies on certain capabilities of Microsoft Outlook; hence subscribers must have Microsoft Outlook installed and configured as their default e-mail client.

Service Providers (Modular Messaging—MSS)

Avaya MSS

With Modular Messaging—MSS, subscribers must configure the Modular Messaging Service Providers for their Microsoft Outlook profiles before they use Modular Messaging Outlook Client.

The Service Providers act as an interface between Microsoft Outlook and the Modular Messaging servers.

Configuring the Service Providers enables the Microsoft Outlook e-mail client to gain access to the Modular Messaging directory as an address book and to send and retrieve messages to and from the Modular Messaging system.

For more information on the Modular Messaging Outlook Client application, see the *Avaya Modular Messaging Microsoft Outlook Client User Guide*, available on the Modular Messaging documentation CD-ROM.

Installing Modular Messaging Outlook Client components

Two factors that decide whether all or some of the components of the Modular Messaging Outlook Client must be installed are:

- Modular Messaging version (MSS, Microsoft Exchange, or IBM Lotus Domino message store)
- Whether or not Microsoft Outlook is installed

Note:

Modular Messaging Outlook Client and Modular Messaging Lotus Notes Client cannot exist on the same personal computer. If Modular Messaging Lotus Notes Client is installed on the subscriber's personal computer, Modular Messaging does not allow installation of Modular Messaging Outlook Client.

During installation, the Modular Messaging Outlook Client setup program prompts the user to enter the name or IP address of the appropriate MAS. The setup program then queries the MAS and identifies the message store being used.

Note:

During a silent installation of Modular Messaging Outlook Client, the MAS name or IP address is passed as a command line argument.

Depending on which message store is used and whether or not Microsoft Outlook is installed, all or some components of Modular Messaging Outlook Client are installed. If Microsoft Outlook is installed, Modular Messaging allows subscribers to install either Modular Messaging Outlook Client with Subscriber Options or only Subscriber Options.

[Table 6](#) explains various scenarios and the components that are installed.

For information on the supported Microsoft Outlook versions, see the *Avaya Modular Messaging Microsoft Outlook Client User Guide*.

Table 6: Components of Modular Messaging Outlook Client installed in various scenarios

Modular Messaging configuration	Microsoft Outlook installed	Client components installed
Modular Messaging—MSS	Yes	Subscriber Options, Voice Form, Voice Recorder Service providers to be configured
Modular Messaging—MSS	No	Subscriber Options
Modular Messaging—Exchange	Yes	Subscriber Options, Voice Form, Voice Recorder
Modular Messaging—Exchange	No	Subscriber Options

Possible Microsoft Outlook profiles

[Table 7](#) describes the configurations that might use the Microsoft Outlook e-mail client.

Table 7: Possible profiles of Microsoft Outlook to use Modular Messaging Outlook Client

Modular Messaging configuration	E-mail server
Modular Messaging—MSS	Microsoft Exchange; used only for corporate e-mails
Modular Messaging—MSS	Any other vendor or no e-mail server
Modular Messaging—Exchange	Microsoft Exchange

Modular Messaging Microsoft Restricted Outlook Client

Avaya MSS

Modular Messaging Restricted Outlook Client is an application that integrates with the Microsoft Outlook program and provides subscribers with access to mailboxes.

The application allows subscribers to create new voice messages, reply to any message type with a voice message, and forward any message type with a voice message—all from within the Microsoft Outlook e-mail client application.

Note:

Modular Messaging—Exchange and Modular Messaging—Domino do not support Modular Messaging Restricted Outlook Client.

Modular Messaging Restricted Outlook Client provides subscribers with an integrated view of their messages, with voice and fax messages in the Modular Messaging inbox, which is separate from the corporate inbox.

The Modular Messaging inbox stores voice, text, and fax messages. In the Modular Messaging inbox, various message types are differentiated by specialized icons. Subscribers can use Modular Messaging Restricted Outlook Client to send, review, forward, and reply to messages from within Outlook. However, subscribers can send, forward, and reply to voice messages received only from Modular Messaging subscribers, both local and remote subscribers.

Note:

Subscribers can address voice messages only to Modular Messaging remote subscribers whose voice mails are networked to the subscriber's Messaging System.

Modular Messaging Restricted Outlook Client temporarily stores voice messages that subscribers intend to send in the Modular Messaging outbox, which is separate from the corporate outbox. Once the voice messages are successfully sent the messages are deleted from the outbox. If there are voice messages in the Modular Messaging outbox and Outlook is closed, Modular Messaging Restricted Outlook Client permanently deletes the messages.

Modular Messaging Restricted Outlook Client enables subscribers to create and to access private messages under suitable administration of the privacy settings.

Subscribers can keep copies of received messages in the Modular Messaging inbox. Subscribers cannot, however, save copies of voice messages on the computer's desktop or in any e-mail folder.

When subscribers use Modular Messaging Restricted Outlook Client to retrieve voice messages, they can either locally play the message on the computer or on the telephone. When subscribers play messages on the telephone, the audio content is streamed from the MSS to the client and then to an MAS for playback over the telephone. Because of this double transfer, Modular Messaging Restricted Outlook Client is not recommended for playing messages remotely by means of the telephone.

Modular Messaging Restricted Outlook Client components

Modular Messaging Restricted Outlook Client provides the following tools:

- Modular Messaging Voice Form. For more information, see [Voice Form](#) on page 78.
- Modular Messaging Voice Recorder. For more information, see [Voice Recorder](#) on page 79.
- Service Providers. For more information, see [Service Providers](#) on page 79.
- Subscriber Options (Voice Mail tab). For more information, see [Subscriber Options](#) on page 87.

Voice Form

The Voice Form allows subscribers to review, record, and send voice messages from Microsoft Outlook. The Voice Form includes a voice control that can be used to create and play voice messages by using either a telephone or local multimedia. The voice control provides familiar audio controls, such as, pause, stop, skip ahead, and skip back. When subscribers play multipart voice content, such as voice messages forwarded with voice comments, the voice control presents the message as a single audio stream.

Subscribers can use the Voice Form to address messages to PDLs created in Modular Messaging Restricted Outlook Client. However, if Modular Messaging Outlook Client exists on a subscriber's system and the subscriber installs Modular Messaging Restricted Outlook Client to replace it, the PDLs created in Modular Messaging Outlook Client are not deleted. The subscriber can address voice messages to these PDLs from Modular Messaging Restricted Outlook Client. For more information on addressing messages to PDLs, see [Addressing from GUI clients](#) on page 142.

The Voice Form provides the following features:

- Directory access for addressing message recipients.
The Voice Form provides access to the MSS directory. The MSS directory includes the Modular Messaging Global Address List, the Modular Messaging PDL, and Personal Contacts. However, Modular Messaging Restricted Outlook Client allows subscribers to address voice messages only to Modular Messaging subscribers and Modular Messaging PDLs.
- User preferences
Using the Voice Form, subscribers can set user preferences such as:
 - Automatic playback of voice messages
 - Playing or recording of voice messages through telephone or multimedia
- Message sensitivity and importance
The Voice Form enables subscribers to set sensitivity and importance on a per-message basis.

- Message privacy

The Voice Form permits subscribers to create private messages. Depending on the system Privacy Enforcement Level setting and the Restrict Client Access COS value, the Voice Form also enables subscribers to access private messages. However, the Voice Form does not restrict forwarding or replying to private messages.

Voice Recorder

Subscribers can use the Voice Recorder to record and send voice mail and voice-annotated items without having to start the Microsoft Outlook e-mail application. This tool works independently from the Voice Form.

Note:

When subscribers send messages, the Voice Recorder relies on certain capabilities of Microsoft Outlook; hence subscribers must have Microsoft Outlook installed and configured as their default e-mail client.

Service Providers

Subscribers must configure the Modular Messaging Service Providers for their Microsoft Outlook profiles before they use Modular Messaging Restricted Outlook Client.

The Service Providers act as an interface between Microsoft Outlook and the Modular Messaging servers.

Configuring the Service Providers enables the Microsoft Outlook e-mail client to gain access to the Modular Messaging directory as an address book and to send and retrieve messages to and from the Modular Messaging system.

For more information on the Modular Messaging Restricted Outlook Client application, see the *Avaya Modular Messaging Microsoft Restricted Outlook Client User Guide*, available on the Modular Messaging documentation CD-ROM.

Installing Modular Messaging Restricted Outlook Client components

Two factors that decide whether all or some of the components of the Modular Messaging Restricted Outlook Client must be installed are:

- Modular Messaging version (MSS message store is supported, Microsoft Exchange and IBM Lotus Domino message store are not supported)
- Whether or not Microsoft Outlook is installed

Note:

Modular Messaging Restricted Outlook Client, Modular Messaging Outlook Client, and Modular Messaging Lotus Notes Client cannot exist on the same personal computer. If Modular Messaging Outlook Client is installed on the subscriber's personal computer, it will be uninstalled when Modular Messaging Restricted Outlook Client is installed. If Modular Messaging Lotus Notes Client is installed on the subscriber's personal computer, Modular Messaging does not allow installation of Modular Messaging Restricted Outlook Client.

Depending on which message store is used and whether or not Microsoft Outlook is installed, all or some components of Modular Messaging Restricted Outlook Client are installed. If Microsoft Outlook is installed, Modular Messaging allows subscribers to install either Modular Messaging Restricted Outlook Client with Subscriber Options or only Subscriber Options.

[Table 8](#) explains various scenarios and the components that are installed.

For information on the supported Microsoft Outlook versions, see the *Avaya Modular Messaging Microsoft Restricted Outlook Client User Guide*.

Table 8: Components of Modular Messaging Restricted Outlook Client installed in various scenarios

Modular Messaging configuration	Microsoft Outlook installed	Client components installed
Modular Messaging—MSS	Yes	Subscriber Options, Voice Form, Voice Recorder Service providers to be configured
Modular Messaging—MSS	No	Subscriber Options
Modular Messaging—Exchange	Not supported	Not supported
Modular Messaging—Domino	Not supported	Not supported

Possible Microsoft Outlook profiles

[Table 9](#) describes the configurations that might use the Microsoft Outlook e-mail client.

Table 9: Possible profiles of Microsoft Outlook to use Modular Messaging Restricted Outlook Client

Modular Messaging configuration	E-mail server
Modular Messaging—MSS	Microsoft Exchange; used only for corporate e-mails
Modular Messaging—MSS	Any other vendor or no e-mail server

Comparing Modular Messaging Outlook Client and Modular Messaging Restricted Outlook Client

Though Modular Messaging Outlook Client and Modular Messaging Restricted Outlook Client look similar, they differ in the way they handle voice messages. To maintain the integrity of voice messages, Modular Messaging Restricted Outlook Client imposes certain restrictions on the actions that can be performed on voice messages. [Table 10](#) lists the various actions that can be performed on a voice message and the extent to which the actions are supported in Modular Messaging Outlook Client and Modular Messaging Restricted Outlook Client.

Table 10: Differences in the support of voice message actions in Modular Messaging Outlook Client and Modular Messaging Restricted Outlook Client

Voice message actions	Modular Messaging Outlook Client	Modular Messaging Restricted Outlook Client
Automatic playback of voice messages	Yes	Yes
Navigate between messages	Yes Both for voice messages and e-mail messages from Voice Form	Yes Only for voice messages from Voice Form
Notify when messages are delivered	Yes Only in Modular Messaging—Exchange	No
Notify when messages are opened	Yes Only in Modular Messaging—Exchange	No
Record and play voice message using telephone or multimedia	Yes	Yes
Attach comments to voice messages	Yes Only in Modular Messaging—Exchange	No

Modular Messaging interfaces

Voice message actions	Modular Messaging Outlook Client	Modular Messaging Restricted Outlook Client
Address voice messages to other users	Yes To Modular Messaging subscribers, other e-mail users, or recipients who use Octel Analog Networking	Yes To Modular Messaging subscribers, both local and remote subscribers However, subscribers can address voice messages only to remote subscribers whose voice mails are networked to the subscriber's Messaging System.
Address voice messages to PDLs	Yes	Yes Only to PDLs created in Modular Messaging Restricted Outlook Client. However, if Modular Messaging Outlook Client exists on a subscribers system and the subscriber installs Modular Messaging Restricted Outlook Client to replace it, the PDLs created in Modular Messaging Outlook Client are not deleted. the subscriber can address voice messages to these PDLs from Modular Messaging Restricted Outlook Client.
Mark voice messages as Private, Confidential, or Personal	Yes Depends on the Privacy Enforcement Level parameter and the Restrict client access feature	Yes Depends on the Privacy Enforcement Level parameter and the Restrict client access feature
Assign priority levels such as High importance and low importance	Yes	Yes
Send voice messages	Yes	Yes Only to Modular Messaging subscribers
Save voice messages	Yes	No

Voice message actions	Modular Messaging Outlook Client	Modular Messaging Restricted Outlook Client
Listen to voice messages	Yes	Yes
Navigating between message parts in a multipart voice message	Yes	Yes
Modify message subject	Yes	No Subscribers cannot add a subject to voice messages they send
Reply to a voice message with a voice message	Yes	Yes Only for voice messages received from Modular Messaging subscribers
Reply to a voice message with an e-mail message	Yes	No
Reply to an e-mail message with a voice message	Yes	Yes
Include the original in your reply	Yes	No
Forwarding voice messages with a voice introduction	Yes	Yes Only to Modular Messaging subscribers. Can forward voice messages received from either Modular Messaging subscribers or non-subscribers
Forwarding voice messages with a text introduction	Yes	No
Deleting voice messages	Yes Stored in the Deleted Items folder	Yes Permanently deleted In Modular Messaging Restricted Outlook Client, the Deleted Items folder does not exist. When a subscriber deletes messages (e-mail, voice, and fax) the messages are permanently deleted.

Modular Messaging IBM Lotus Notes Client

Avaya MSS

Modular Messaging Lotus Notes Client is an application that integrates with the IBM Lotus Notes program and provides subscribers with access to mailboxes. The application allows subscribers to view their voice and fax messages in the Modular Messaging inbox, which is separate from the corporate inbox.

The Modular Messaging inbox stores voice, text, and fax messages. In the Modular Messaging inbox, various message types are differentiated by specialized icons. Modular Messaging Lotus Notes Client allows subscribers to create new voice messages, reply to any message type with a voice message, and forward any message type with a voice message—all from within the IBM Lotus Notes e-mail client application.

Note:

Modular Messaging—Exchange and Modular Messaging—Domino do not support Modular Messaging Lotus Notes Client.

Subscribers can keep copies of messages that the Modular Messaging inbox receives. Subscribers can copy messages from the Modular Messaging inbox to other folders, such as a folder in the corporate inbox or on the desktop. However, subscribers cannot copy messages from other folders or inboxes into the Modular Messaging inbox.

When subscribers use Modular Messaging Lotus Notes Client to retrieve voice messages, they can play the message either locally on the computer or on the telephone. When subscribers play messages on the telephone, the audio content is streamed from the MSS to the client and then to an MAS for playback over the telephone. Because of this double transfer, Modular Messaging Lotus Notes Client is not recommended for playing messages remotely by means of the telephone.

Modular Messaging Lotus Notes Client components

Modular Messaging Lotus Notes Client provides the following tools:

- Modular Messaging Voice Form. For more information, see [Voice Form](#) on page 84.
- Modular Messaging Voice Recorder. For more information, see [Voice Recorder](#) on page 85.
- Service Providers. For more information, see [Service Providers](#) on page 85.
- Subscriber Options (Voice Mail tab). For more information, see [Subscriber Options](#) on page 87.

Voice Form

The Voice Form allows subscribers to review, record, and send voice messages from IBM Lotus Notes. The Voice Form includes a voice control that can be used to create and play voice messages by using either a telephone or local multimedia. The voice control provides familiar

audio controls, such as pause, stop, skip ahead, and skip back. When subscribers play multipart voice content, such as voice messages forwarded with voice comments, the voice control presents the message as a single audio stream.

Subscribers can use the Voice Form to address messages to PDLs.

For more information on addressing messages to PDLs, see [Addressing from GUI clients](#) on page 142.

The Voice Form provides the following features:

- Directory access for addressing message recipients. The Voice Form provides access to the MSS directory. The MSS directory includes the Modular Messaging Global Address List, the Modular Messaging PDL, and Personal Contacts. The Voice Form also provides directory access for addressing messages to PDLs.
- User preferences
Using the Voice Form, subscribers can set user preferences for automatic playback of voice messages.
- Message sensitivity and importance
The Voice Form enables subscribers to set sensitivity and importance on a per-message basis.
- Message subject
The Voice Form permits subscribers to add a subject when creating a new message or when replying to or forwarding a message. The message subject makes it easier for recipients to refer to messages when using a GUI client or a TUI. The Voice Form also enables subscribers to edit text subjects of messages they have received.
Subscribers can use message subjects as search criteria, thus making it easier to locate specific messages.

Voice Recorder

Subscribers can use the Voice Recorder to record and send voice mail and voice-annotated items without having to start the IBM Lotus Notes e-mail application. This tool works independently from the Voice Form.

Note:

When subscribers send messages, the Voice Recorder relies on certain capabilities of IBM Lotus Notes; hence subscribers must have IBM Lotus Notes installed and configured as their default e-mail client.

Service Providers

Subscribers must configure the Modular Messaging Service Providers for their IBM Lotus Notes profiles before they use Modular Messaging Lotus Notes Client.

The Service Providers act as an interface between IBM Lotus Notes and the Modular Messaging servers.

Modular Messaging interfaces

Configuring the Service Providers enables the IBM Lotus Notes e-mail client to gain access to the Modular Messaging directory as an address book and to send and retrieve messages to and from the Modular Messaging system.

For more information on the Modular Messaging Lotus Notes Client application, see the *Avaya Modular Messaging IBM Lotus Notes Client User Guide*, available on the Modular Messaging documentation CD-ROM.

Installing Modular Messaging Lotus Notes Client components

Two factors that decide whether all or some of the components of the Modular Messaging Lotus Notes Client must be installed are:

- Modular Messaging version (MSS, Microsoft Exchange, or IBM Lotus Domino message store)
- Whether or not IBM Lotus Notes is installed

Note:

Modular Messaging Outlook Client and Modular Messaging Lotus Notes Client cannot exist on the same personal computer. If Modular Messaging Outlook Client is installed on the subscriber's personal computer, Modular Messaging does not allow installation of Modular Messaging Lotus Notes Client.

During installation, the Modular Messaging Lotus Notes Client setup program prompts the user to enter the name or IP address of the appropriate MAS. The setup program then queries the MAS and identifies the message store being used.

Note:

During a silent installation of Modular Messaging Lotus Notes Client, the MAS name or IP address is passed as a command line argument.

Depending on which message store is used and whether or not IBM Lotus Notes is installed, all or some components of Modular Messaging Lotus Notes Client are installed. If IBM Lotus Notes is installed, Modular Messaging allows subscribers to install either Modular Messaging Lotus Notes with Subscriber Options or only Subscriber Options.

[Table 11](#) explains various scenarios and the components that are installed. For information on the supported IBM Lotus Notes versions, see the *Avaya Modular Messaging IBM Lotus Notes Client User Guide*.

Table 11: Components of Modular Messaging Lotus Notes Client installed in various scenarios

Modular Messaging configuration	IBM Lotus Notes installed	Client components installed
Modular Messaging—MSS	Yes	Subscriber Options, Voice Form Service providers to be configured
Modular Messaging—MSS	No	Subscriber Options

Possible IBM Lotus Notes profiles

[Table 12](#) describes the configurations that might use the IBM Lotus Notes e-mail client.

Table 12: Possible profiles of Lotus Notes to use Modular Messaging Lotus Notes Client

Modular Messaging configuration	E-mail server
Modular Messaging—MSS	IBM Lotus Domino; used only for corporate e-mails
Modular Messaging—MSS	Any other vendor or no e-mail server

Subscriber Options

Subscribers can use the Subscriber Options application to modify their mailbox settings from a desktop computer.

With Modular Messaging—MSS, Subscriber Options integrates with the Microsoft Outlook or the IBM Lotus Notes e-mail client. With Modular Messaging—Exchange, Subscriber Options integrates with the Microsoft Outlook e-mail client. Subscriber Options also works as a standalone application for subscribers who do not use the Microsoft Outlook or the IBM Lotus Notes e-mail client.

With Modular Messaging—Domino, Subscriber Options can be installed by installing the DUC application.

In Modular Messaging—MSS, when Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, or Modular Messaging Lotus Notes Client installs the Subscriber Options component, an additional property page is attached to the e-mail options pages. Subscribers can use the **Voice Mail** tab to access Subscriber Options from Microsoft Outlook or

Modular Messaging interfaces

IBM Lotus Notes. Subscriber Options also appears as an option in the Programs submenu in Windows.

Subscriber Options is a component that Modular Messaging subscribers can use to modify their mailbox settings from a desktop computer. Subscribers can modify all or some of their mailbox settings, depending on how the mailbox is configured by the administrator.

With Subscriber Options, subscribers can compose greetings and set up preferences for using the TUIs and the GUI clients.

Subscribers can use Subscriber Options for performing the following tasks:

- **Configuring Call Handling**

Screen calls from the Automated Attendant, override Call Handling, and choose greetings for an extension that is busy or unanswered.

- **Managing greetings**

Record spoken name, personal greeting, Please Hold prompt, optional greetings, and EAG

- **Configuring settings for the TUIs**

Sort messages in the inbox by priority, by the order in which they were received, or by message type; specify fax number for printing faxes, prompt language for mailbox, and rules for new message alerts.

Note:

Sorting by message type feature is applicable only to Modular Messaging AUDIX TUI and Modular Messaging Serenade TUI. Subscribers of Modular Messaging Aria TUI do not require to sort their messages by message type since the TUI provides separate queues for each message type.

- **Configuring time zones for a mailbox**

Assign a specific time zone and indicator for daylight saving time to a mailbox.

- **Configuring Personal Operator**

Assign a mailbox number or extension number as the personal operator and select a schedule for the personal operator.

Note:

Subscribers can configure personal operators for their mailboxes only if the administrator has assigned the required permissions to the subscribers.

- **Setting rules for special features:**

- Find Me to schedule the redirection of unanswered calls to one or more telephone numbers.
- Call Me to schedule calls to subscribers at one or more designated telephone numbers when messages that meet certain criteria arrive in their mailboxes.
- Notify Me to notify subscribers of new Call Answer messages in their mailboxes and of missed incoming calls, if requested by the caller.

- MWI to alert subscribers when messages meeting specified criteria arrive in their mailboxes.
- Creating and managing PDLs:
 - Subscribers can create new PDLs and modify or delete existing PDLs. For more information, see [Working with PDLs](#) on page 138.

For more information, see *Avaya Modular Messaging Subscriber Options*, available on the Modular Messaging documentation CD-ROM.

Web Subscriber Options

Subscribers can use the Web Subscriber Options application to modify their mailbox settings from a Web browser. Subscribers can modify all or some of their mailbox settings, depending on how the mailbox is configured by the administrator.

Modular Messaging allows only authenticated subscribers to log in to Web Subscriber Options. Modular Messaging—MSS subscribers can also log in to Web Subscriber Options using a Quick Logon from Modular Messaging Web Client.

Subscribers must enter their mailbox numbers and numeric passwords to enter Web Subscriber Options.

Note:

Subscribers with the English version of the Modular Messaging message stores can also enter the alphabetic equivalent of their numeric passwords by using the computer keyboard.

If the subscriber's credentials are appropriate for the message store being used, the Web server allows the subscriber to access Web Subscriber Options.

With Web Subscriber Options, subscribers can compose greetings and set up preferences for using the TUIs and the GUI clients.

Subscribers can use Web Subscriber Options to perform the following tasks:

- Configuring Call Handling

Screen calls from the Automated Attendant, override Call Handling, and choose greetings for an extension that is busy or unanswered.
- Managing greetings

Record spoken name, personal greeting, Please Hold prompt, optional greetings, and EAG
- Configuring settings for the TUIs

Sort messages in the inbox by priority, by order in which they were received, or by message type; specify fax number for printing faxes, prompt language for mailbox, and rules for new message alerts.

Note:

Sorting by message type capability is applicable only to Modular Messaging AUDIX TUI and Modular Messaging Serenade TUI. Subscribers of Modular Messaging Aria TUI do not require to sort their messages by message type since the TUI provides separate queues for each message type.

- Configuring multiple time zones for a mailbox

Assign a specific time zone to a mailbox.

- Configuring Personal Operator

Assign a mailbox number or extension number as the personal operator and select a schedule for the personal operator.

Note:

Subscribers can configure personal operators for their mailboxes only if the administrator has assigned the required permissions to the subscribers.

- Setting rules for special features:

- Find Me to schedule the redirection of unanswered calls to one or more telephone numbers.
- Call Me to schedule calls to subscribers at one or more designated telephone numbers when messages that meet certain criteria arrive in their mailboxes.
- Notify Me to notify subscribers of new Call Answer messages in their mailboxes and of missed incoming calls, if requested by the caller.
- Message Waiting Indicator to alert subscribers when messages meeting specified criteria arrive in their mailboxes.

- Creating and managing PDLs

Modular Messaging—MSS subscribers can create new PDLs and modify or delete existing PDLs. In Modular Messaging—MSS, subscribers use Subscriber Options, Web Subscriber Options, or the TUIs to create new PDLs.

Modular Messaging—Exchange and Modular Messaging—Domino subscribers use their e-mail server or the TUIs to create PDLs. Using Subscriber Options and Web Subscriber Options, Modular Messaging—Exchange and Modular Messaging—Domino subscribers can modify an Exchange or a Domino distribution list to a PDL. Other than creating PDLs, Modular Messaging—Exchange and Modular Messaging—Domino subscribers can record list names and change the numeric identifier of PDLs. For more information, see [Working with PDLs](#) on page 138.

For more information, see the online Help system provided with the Web Subscriber Options application.

Subscriber-controlled parameters from Subscriber Options and Web Subscriber Options

In Modular Messaging, some capabilities can be configured by using the TUIs, the Subscriber Options, or the Web Subscriber Options. [Table 13](#) lists the capabilities that are programmed exclusively from Subscriber Options or Web Subscriber Options.

Table 13: Capabilities programmed exclusively from Subscriber Options and Web Subscriber Options

Capability	Description
Call Me rules	Subscribers can create rules for using Call Me from Subscriber Options or Web Subscriber Options. The rules include the destination telephone numbers. The Call Me rules can be enabled or disabled by using Subscriber Options, Web Subscriber Options, or the TUIs.
Find Me rules	Subscribers can create rules for using Find Me from Subscriber Options or Web Subscriber Options. The rules include the destination telephone numbers. The Find Me rules can be enabled or disabled by using Subscriber Options, Web Subscriber Options, or the TUIs.
Notify Me rules	Subscribers can set rules for using Notify Me-Caller Requested and Notify Me-Automatic from Subscriber Options or Web Subscriber Options. The rules can be enabled or disabled by using Subscriber Options, Web Subscriber Options, or from the Modular Messaging Aria TUI.
MWI rules	Subscribers can create rules for using MWI from Subscriber Options or Web Subscriber Options. The rules can be enabled or disabled by using Subscriber Options or Web Subscriber Options.
Subscriber mailbox voice prompt language	Subscribers can set the default language in which voice prompts are played to them when they dial in to their mailboxes, using Subscriber Options or Web Subscriber Options.
Subscriber mailbox Multilingual Call Answering languages	Subscribers can enable the Multilingual Call Answering feature using Subscriber Options or Web Subscriber Options. The three multilingual Call Answering languages, primary, secondary, and tertiary, can also be set only through Subscriber Options and Web Subscriber Options.
Subscriber mailbox time zone selection	Subscribers can select a specific time zone for their mailboxes by using the Subscriber Options and Web Subscriber Options.

Table 13: Capabilities programmed exclusively from Subscriber Options and Web Subscriber Options (continued)

Capability	Description
Subscriber TUI message sorting capabilities	<p>Subscribers can set the various message-sorting capabilities of their TUIs by using Subscriber Options and Web Subscriber Options. The messages in a subscriber mailbox can be sorted by priority, by order in which the messages were received, or by message type.</p> <p>Note:</p> <p>Sorting by message type capability is applicable only to Modular Messaging AUDIX TUI and Modular Messaging Serenade TUI subscribers. Subscribers of Modular Messaging Aria TUI do not require sorting their messages by message type since the TUI provides separate queues for each message type.</p>
PDLs	<p>Subscribers can create PDLs by using Subscriber Options, Web Subscriber Options, or the TUIs. Subscriber Options or Web Subscriber Options is required for the following enhanced capabilities: edit the identifier, create the display name, include an internet e-mail address in the list, and include a fax number in the list.</p>

Desktop deployment of Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, Modular Messaging Lotus Notes Client, and Subscriber Options

To facilitate desktop deployment of Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, Modular Messaging Lotus Notes Client, and Subscriber Options, organizations can do the following:

- Place the software on a server to make it available to subscribers for download.
- Push software to subscribers through Microsoft Systems Management Server (SMS). SMS allows the distribution of software over a network to client computers with little to no intervention from the computer user.
- Use the Software Installation component of the Active Directory Group Policy Object Editor to centrally manage a push of software to desktops.

Modular Messaging Web Client

Avaya MSS

Modular Messaging Web Client enables subscribers to use a Web browser for visual access to their Modular Messaging messages and to corporate e-mail messages.

Modular Messaging Web Client does *not* support access to Avaya legacy messaging servers, such as Octel or the Intuity AUDIX servers.

In Modular Messaging Release 3 and later, the user interface of Modular Messaging Web Client is enhanced. For example, Modular Messaging Web Client no longer uses pop-ups.

Modular Messaging allows only authenticated subscribers with an MSS message store to log in to Modular Messaging Web Client.

Subscribers of Modular Messaging—MSS must enter their mailbox numbers and numeric passwords to enter Modular Messaging Web Client.

Note:

Subscribers with the English version of the Modular Messaging message stores can also enter the alphabetic equivalent of their numeric passwords by using the computer keyboard.

If a subscriber's credentials are appropriate, the Web server allows the subscriber to access Modular Messaging Web Client.

Modular Messaging provides a Quick Logon from Modular Messaging Web Client to Web Subscriber Options. Thus, if a subscriber is authenticated for Modular Messaging Web Client, the subscriber can access Web Subscriber Options without re-entering the log-in credentials. Modular Messaging Web Client provides a link to the Web Subscriber Options. Subscribers can use this link to access Web Subscriber Options.

Modular Messaging Web Client provides a visual interface that subscribers can use to create, send, receive, reply to, forward, and organize their messages from the Modular Messaging mailbox. Subscribers can listen to voice messages and view fax messages and text messages from a computer.

With Modular Messaging Web Client, subscribers can play and record voice messages either through their telephone or through the local multimedia of their computers. Subscribers must use an additional software application, either a local player or the Avaya Voice Player, to play or record messages with the local multimedia. Modular Messaging Web Client provides subscribers the option to download the Avaya Voice Player application.

If administrators do not want subscribers to store voice messages on their computers, they can restrict subscribers from downloading the Avaya Voice Player. Administrators can disable the Avaya Voice Player option of Modular Messaging Web Client for the subscribers. If the option is disabled, subscribers can use only the telephone to listen to or record voice messages.

Modular Messaging interfaces

From Modular Messaging Web Client, subscribers can also send messages to the PDLs they own. For information on addressing messages to PDLs, see [Addressing from GUI clients](#) on page 142.

The Modular Messaging Web Client inbox presents visual indicators, known as message flags, that help subscribers to easily identify broadcast messages, priority messages, private messages, and delivery failures.

Modular Messaging Web Client provides:

- An integrated view of voice, fax, and text messages in the Modular Messaging mailboxes of subscribers.
 - Message organizational capabilities, such as:
 - Sorting messages by type, sender, subject, folder, or receipt time
 - Searching for a particular message
 - Moving messages within the inbox from one folder to another. Subscribers can move New messages to the Deleted folder or Saved folder, saved messages to the Deleted folder, and deleted messages to the Saved folder.
 - Directory browsing

Provides access to the Modular Messaging voice server directory so that from the directory, subscribers can search for other users and address messages to them.
 - Toggle between telephone and local multimedia

Modular Messaging Web Client allows subscribers to toggle between recording messages by using local multimedia of their computer and using the telephone, regardless of the default settings.
 - Choice of language to view the interface

Provides subscribers with a choice of languages to view the interface. The language choices are listed in [Table 2](#).
- Note:**
- The administrative interfaces of Modular Messaging Web Client are available only in U.S. English.
- Support Secure Sockets Layer (SSL) for secured access

Modular Messaging Web Client supports SSL Web connections. However, customers must configure SSL on the Web server (as per the configuration supported by IIS) prior to installing the Web Client.

Whether Web browsers connect by using SSL depends only on the Web server configuration and not on any settings in the Modular Messaging Web Client application.
 - Access to e-mails on a corporate e-mail server

Using the IMAP4 protocol, Modular Messaging Web Client provides subscribers with access to e-mail messages stored on a separate, corporate e-mail server. Subscribers can

view, reply to, forward, create, send, save, and delete e-mail messages. Subscribers can also access the corporate LDAP directory to address e-mail messages.

- **Maximum message privacy enforcement**

When subscribers access messages that are marked private, Modular Messaging Web Client provides an appropriate indication to subscribers. Regardless of the system Privacy Enforcement Level setting for the VMD, Modular Messaging Web Client always enforces maximum message privacy—subscribers cannot forward private messages. For more information on the Privacy Enforcement Level settings, see [The Privacy Enforcement Level parameter](#) on page 148.

Administrators can configure Modular Messaging Web Client to support only dual-connect (telephone-playback only) mode. This prevents voice messages from being played locally on the computer, downloading voice messages, and caching voice messaging on the computer.

- **Text subject creation**

Subscribers using Modular Messaging Web Client can create a text subject when composing a new message. A text subject makes it easier for recipients to refer to the message when using a GUI client or scanning by means of the TUI. Subscribers can create a subject text when composing a message; subscribers cannot change subject texts once messages are sent.

Note:

For information on using Web Client, see the online Help system provided with the Web Client application. For information on the system requirements for Modular Messaging Web Client, see [Modular Messaging Web Client requirements](#) on page 408.

- **Edit message subject line**

Modular Messaging Web Client allows subscribers to edit the subject lines of messages. However, a subscriber can edit the subject line only if the administrator has set the feature for the system.

- **Address messages to PDL**

Using Modular Messaging Web Client, subscribers can address messages to a PDL.

- **Drag and drop messages**

Subscribers using Modular Messaging Web Client can drag and drop messages into a Modular Messaging Web Client folder.

- **Set message notifications**

Subscribers can set Modular Messaging Web Client to notify them when they receive new messages.

Standards-based clients with Modular Messaging—MSS

Avaya MSS

With the appropriate privacy settings, Modular Messaging subscribers can use standards-based e-mail clients to receive, send, and manage messages from a desktop computer.

Subscribers can gain access to and deal with messages by using a variety of clients that support either the IMAP4 or the POP3 e-mail standard. Clients include Microsoft Outlook, Microsoft Outlook Express, and IBM Lotus Notes.

Although most clients support both IMAP4 and POP3, some clients, such as some versions of Microsoft Outlook, support only the older POP3 protocol. When you are using a standards-based client with Modular Messaging, Avaya strongly recommends the use of IMAP4. POP3 clients copy messages from the subscriber's mailbox and act on the local copy without informing the server of status changes, for example, whether a message has been read or deleted.

The local copy is not aware of the message status on the original message store. Thus, if a POP3 user pulls copies of their voice messages into the e-mail client and later use the TUI to delete a message from the message store, the local copy of the message in the e-mail client will remain.

In contrast, IMAP4 clients act on the message stored on the server so message status is synchronized with the actions of other clients, such as the TUI.

Avaya support policy for third-party clients

Modular Messaging is standards based, which includes IMAP4 access to messages from user client software packages (for example, Microsoft Outlook and IBM Lotus Notes). Avaya has conducted successful interoperability testing with Microsoft Outlook 2002; Microsoft Outlook 2000; Microsoft Outlook Express 5.0; and IBM Lotus Notes R5, R6 and R7.

Furthermore, Avaya acknowledges that customers have reported successful integration of GroupWise with Modular Messaging and acknowledges that our customers may integrate other IMAP4 user client software packages with Modular Messaging. Avaya, however, makes no representations, warranties, or guarantees regarding specific capabilities with specific IMAP4 clients or successful integration or interoperability. Avaya's product support is limited to IMAP4 as it is implemented on Modular Messaging and does not include support for specific e-mail clients.

IBM Lotus Notes with IBM Lotus Domino Unified Communications

IBM Lotus Domino

From the IBM Lotus Notes proprietary client on a computer with the Windows operating system, subscribers can use the following IBM Lotus DUC services:

- Integrated voice mailbox

A specialized IBM Lotus Notes mail file provides a combined inbox for all messages, as well as a voice inbox tailored for voice message display and management.

- Voice Message Form with Player/Recorder

The Voice Message Form, while maintaining the look and feel familiar to both Lotus Notes and iNotes Web Access clients, includes an integrated player/recorder that subscribers use to create and play voice messages, from either a telephone or a multimedia computer. The player/recorder provides familiar audio controls, such as pause, stop, skip ahead, and skip back.

- Subscriber Options

Using Subscriber Options, subscribers can modify their mailbox settings at any time from the Lotus Notes client and Lotus Domino Administrator client. For more information, see [Subscriber Options](#) on page 87.

Unified Communication Center Speech Access

Unified Communication Center (UCC) Speech Access is a complementary Avaya product providing a speech user interface that supports all versions of Modular Messaging.

Using speech recognition and TTS technology, UCC Speech Access communicates with callers in spoken English, enabling mobile professionals to gain access to their business computer resources from any telephone. UCC Speech Access also provides access to voice mail messages, Call Answering, and follow-me/hold-my-calls filtering.

In addition, with the use of Avaya UCC, subscribers can launch telephone calls, either single-party or multi-party conference calls, all from a single session.

UCC Speech Access also provides e-mail reading capabilities. Modular Messaging—MSS subscribers do not have access to corporate e-mails from the Modular Messaging TUIs. However, they can use UCC Speech Access for TTS conversion of corporate e-mail messages.

With all versions of Modular Messaging, UCC Speech Access can provide, among other things, speech access and voice control of voice and corporate e-mail messages.

UCC Speech Access enables subscribers to create and to access private messages. For more information, see [Message Privacy](#) on page 145.

For more information, see the UCC Speech Access client product documentation (Site Preparation Guide, Installation Guide, and Wallet Card) available at <http://www.avaya.com/support>.

Administrative and management interfaces

Modular Messaging provides administrators with different interfaces or tools for the administration of the MSS, MAS units, Modular Messaging Web Client, and Caller Applications. In addition, Modular Messaging provides a reporting tool for monitoring voice mail system usage.

Note:

For information on the administrative interface for Modular Messaging Web Client, see the online Help system provided with the Modular Messaging Web Client application. For information on the Caller Applications Editor, used to create, deploy, and modify Caller Applications, see [Caller Applications Editor](#) on page 43.

Message Storage Server administration

Avaya MSS

The Web-based administrative interface of the MSS provides administration, diagnostics, and reporting capabilities, using a standard Web browser from anywhere in the enterprise. Organization-wide administrative utilities can also be used, as specified in [Ease of administration](#) on page 35.

In addition to providing this Web-based administrative interface, Modular Messaging supports the Mailbox Manager application or Avaya Integrated Management with Avaya Site Administration or Avaya MultiSite Administration for MSS mailbox administration.

Mailbox Manager

Modular Messaging—MSS administrators can use the Mailbox Manager application to administer subscriber data and for other Avaya voice mail products in an enterprise.

The Mailbox Manager application for Modular Messaging is a Windows interface for performing moves, adds, and changes on the MSS. The software maintains an offline database of subscriber and COS data. Using this Windows interface, administrators can make changes to these records and send them to the MSS.

The Mailbox Manager application for the MSS can be implemented in the following configurations:

- Single administrator/single-site
- Single administrator/multisite
- Multiadministrator/single-site
- Multiadministrator/multisite

Modular Messaging interfaces

A single Mailbox Manager client and database can be used to manage mailbox moves, adds, and changes across a heterogeneous mix of systems, such as:

- Modular Messaging with MSS
- Intuity AUDIX LX
- Intuity AUDIX MAP5/40/100
- Octel 250/350 (Aria)
- Octel 200/300 (Serenade)

This enables administrators to use a common look and feel to manage moves, adds, and changes for all their systems and to centralize the administration of all mailboxes on these systems.

The Mailbox Manager application is typically installed on a desktop or laptop computer used by the system administrator. However, if the corporate network has a dynamic host configuration protocol (DHCP) environment, the Mailbox Manager application must be installed on a trusted server.

For more information on the minimum system requirements for a single user implementation of the Mailbox Manager application, see [Mailbox Manager minimum requirements](#) on page 417.

For more information on the Mailbox Manager application, see the related documentation on the Mailbox Manager Software CD, or visit <http://www.avaya.com/support>.

Avaya Integrated Management

Modular Messaging can be administered with Avaya Integrated Management. Avaya Site Administration (Release 2.0 or later) or Avaya MultiSite Administration (Release 2.1 or later) can be used to perform subscriber move, add, change, and remove activity and to define COS for Modular Messaging in conjunction with an associated user station extension on the Communication Manager Media Server. This tool also provides import and export support of subscriber data for Modular Messaging.

MAS administration

An MAS provides administration tools such as the VMSC tool and Visual Voice Editor.

For more information on using these tools, see the Modular Messaging, Messaging Application Server administration guides, available on the *Avaya Modular Messaging Documentation* CD-ROM.

Reporting capabilities

Modular Messaging provides a Reporting Tool that administrators can use to generate predefined reports for monitoring voice mail system usage, planning capacity, and tracking system security.

Report information is taken from the transaction database and generated for the VMD. Some reports can also generate MAS-specific or subscriber-specific information.

Administrators can export a report to save the report information or work with it by using alternative tools. The export facility supports a number of popular spreadsheet, word processor, and data interchange formats. Administrators can attach an exported report file to a message sent using a Messaging Application Programming Interface (MAPI)-enabled e-mail system, or can print a report displayed on the screen.

The MSS collects information about system settings and attributes and information that depicts how the system is used, including data about features, subscribers, communities, data port loads, and remote-messaging traffic. This information is displayed in real-time dynamic report pages and in messaging traffic reports.

Chapter 4: Modular Messaging features

This chapter discusses the key features of Avaya Modular Messaging and includes the following topics:

- [Key features and capabilities](#) on page 104
- [Text-to-speech conversion capability](#) on page 117
- [Simple Network Management Protocol with Modular Messaging](#) on page 119
- [Logs and notifications](#) on page 120
- [Licensing](#) on page 125
- [Audio encoding formats](#) on page 126
- [Communities and sending restrictions](#) on page 130
- [System lists](#) on page 132
- [Personal Distribution Lists](#) on page 136
- [Message Privacy](#) on page 145
- [Setting time zones](#) on page 156
- [Backup capabilities](#) on page 158
- [Subscriber data migrations and system upgrades](#) on page 163

Key features and capabilities

[Table 14](#) discusses the key features of Modular Messaging.

Table 14: Key features and capabilities

Feature and capability	Description and benefit
Modular Messaging supports the S3500 hardware model.	In Modular Messaging Release 3 and later, support for the S3500 hardware model is introduced. In the earlier releases, servers used the S3400 hardware model. The S3500 hardware model is easy to handle, as it is only two units tall, when compared to the S3400 model, which is four units tall. S3500 also provides the following benefits: <ul style="list-style-type: none"> • Faster processor, 3.4-GHz processor • More RAM, 2GB • Faster disk speed
Modular Messaging supports single-digit menus in the form of Caller Applications.	These are separate applications, such as complex Automated Attendants, listen-only mailboxes, and bulletin boards, which can be designed using a Microsoft Windows graphical user interface (GUI)-based editor tool that is deployed across voice mail domains. Caller Applications can be used to accomplish most of the same functions as Automated Attendants (including nested Automated Attendants).
Telephone user interface (TUI) for accessing messages	
Playback messages	Subscribers can play back messages received in their mailbox. While listening to messages subscribers can use the playback buttons such as Rewind and Forward.
Reply to sender or all recipients	When replying to messages, subscribers can reply only to the sender or to all recipients of which Modular Messaging is aware. When replying to messages that are received through a Message Networking system, subscribers can reply only to the sender. Messages coming through a Message Networking server will not contain a complete list of recipients because the Message Networking server cannot be sure that it received a complete list of recipients from the originating node. Modular Messaging respects the use of Blind Carbon Copy (BCC) when used with a GUI client.
Priority of messages	Subscribers can assign a priority to messages.
Print fax messages	Subscribers can print fax messages with Tag Image File Format (TIFF)/F Profile for Facsimile attachments.

Table 14: Key features and capabilities (continued)

Feature and capability	Description and benefit
Cross-media response	Subscribers can reply to messages in one medium (for example, fax) with another medium (for example, voice).
Specifying message type and sorting messages by message type	<p>When accessing messages in a Modular Messaging Aria TUI, subscribers can specify the message type. The TUI then moves the messages in their respective queues. Modular Messaging Aria TUI provides separate queues for each message type.</p> <p>Modular Messaging AUDIX TUI and Modular Messaging Serenade TUI do not provide separate queues for each message type. However, subscribers of these TUIs can sort messages by message type, which allows subscribers to quickly access messages of a type such as, voice messages. Messages will be sorted first by their message type and then by the subscriber-specified order: Urgent, Last In First Out (LIFO), or First In First Out (FIFO).</p>
GUI clients for accessing messages	
Receive, respond to, and send messages	<p>Subscribers can use a standards-based e-mail client or a supported GUI client to receive, reply to, forward, and send messages.</p> <p>For more information, see Graphical user interfaces on page 70.</p>
Manage and respond to all messages	Subscribers can store, organize, delete, or respond to all types of messages.
Reply to messages	Subscribers can reply to only the sender, to all recipients, or to an edited list of recipients.
Cross-media response	Subscribers can reply to messages in one medium (for example, voice) with another medium (for example, text).
Mailbox personalization	
Mailbox personalization using the TUI	<p>Subscribers can perform the following tasks:</p> <ul style="list-style-type: none"> ● Record and activate greetings and spoken names. ● Enable or disable Find Me, Call Me, and Notify Me. ● Set up call handling. ● Configure a fax number for printing. ● Record announcements for use in Caller Applications. ● Change passwords. ● Configure a personal operator.

Table 14: Key features and capabilities (continued)

Feature and capability	Description and benefit
Mailbox personalization using the computer	<p>Using Subscriber Options and Web Subscriber Options, subscribers can perform the following tasks:</p> <ul style="list-style-type: none"> ● Record and activate greetings and spoken names. ● Personalize call handling. ● Set up rules for Message Waiting Indicator (MWI), Find Me, Call Me, and Notify Me. ● Change password. ● Configure desktop computer and TUI preferences and options. ● Change the display language.
<p>Message and call notification</p> <p>Note: Some of these features might not be available with all switch integrations (SWINs).</p>	
Call Me	This feature alerts subscribers of new messages in their inboxes by calling them at one or more designated numbers.
Notify Me	<p>This feature provides the following capabilities:</p> <ul style="list-style-type: none"> ● Automatic notification capabilities: Notifies subscribers of new messages that meet certain subscriber-specified criteria. ● Caller-requested notification capabilities: Notifies subscribers of missed incoming calls, provided that the caller requests that the subscriber be notified. <p>The notification is sent as an e-mail message that can be directed to any e-mail address or as a call to a numeric pager. If the notification is an e-mail message, the e-mail address might not be a conventional mailbox. For example, through a suitable gateway, the address can identify a pager, an Short Message Service (SMS) cell phone, or any other e-mail-enabled notification mechanism.</p>
MWI	This feature alerts subscribers that new messages are waiting by using a lamp indicator or a stutter dial tone.
Find Me	<p>This feature redirects unanswered calls to another location, allowing callers to reach Modular Messaging subscribers live.</p> <p>Find Me is not supported for analog integrations.</p>

Table 14: Key features and capabilities (continued)

Feature and capability	Description and benefit
International product considerations	
Language pack support	<p>Modular Messaging supports multiple languages, which allows companies to use the messaging system worldwide.</p> <p>A Modular Messaging language pack contains user interface resources for all administration and client applications for a particular language. This feature allows subscribers to update all Modular Messaging applications for a language by using a single language pack.</p>
Multi-Byte character set	<p>Some languages, such as Japanese and Chinese, have large character sets. Each character of these languages consists of more than one byte.</p> <p>To support language packs for languages with large character sets, Modular Messaging supports Multi-Byte character set.</p> <p>This feature allows subscribers to view and use non-English versions of Modular Messaging clients and Modular Messaging administration GUIs.</p>
Native language operating system support	<p>When subscribers run a non-English version of Microsoft Windows, they can run the respective non-English version of the Modular Messaging clients. For example, Subscriber Options with the German language pack is supported when running on the German version of Windows 2000 Professional or the German version of Windows XP Professional.</p> <p>Modular Messaging Web Client servers run only with the English versions of the operating system.</p>
Multilingual Call Answer	<p>Subscribers can enable up to three Call Answer languages, primary, secondary, and tertiary, to their mailbox.</p> <p>This feature allows callers to select a language for system prompts and announcements.</p> <p>Subscribers can set the Call Answer languages in Subscriber Options or Web Subscriber Options.</p>

Functional differences based on message store

In addition to the features described in [Table 14](#), some features and capabilities have functional differences based on the message store, i.e., Modular Messaging—Avaya Message Storage Server (MSS), Modular Messaging—Exchange and Modular Messaging—Domino. [Table 15](#) discusses these features..

Table 15: Features and capabilities of Modular Messaging

Feature and capability	Description and benefit	
	Modular Messaging—MSS	Modular Messaging—Exchange Modular Messaging—Domino
Voice and fax messaging		
Combined voice and fax messaging capabilities	The Modular Messaging system stores voice, fax, and text messages, as well as messages with binary attachments in the MSS.	The Modular Messaging system stores voice, fax, and e-mail messages in Microsoft Exchange and IBM Lotus Domino.
TUI for accessing, sending, and composing messages		
Receive, respond to, and send messages	Subscribers can receive, reply to, forward, and send voice and fax messages over the telephone.	Subscribers can receive, reply to, forward, and send voice, fax, text, and corporate e-mail messages over the telephone. Modular Messaging reads corporate e-mail messages and subject headers by using e-mail readers for text-to-speech (TTS) conversion. For Modular Messaging—Domino, response time for login and TUI may be slow for large mailboxes of 100 messages or more.
Printing messages	From the TUI, subscribers can print fax messages to a default fax destination or to a new fax destination. When calling from a fax machine, subscribers can print the current fax message in the same call, thus terminating the subscriber log-in session. For more information, see Printing fax messages on page 203.	Subscribers can print e-mail or fax messages with TIFF attachments.
Read receipt and delivery receipt		Requests for read receipt from the TUI are supported.

Table 15: Features and capabilities of Modular Messaging (continued)

Feature and capability	Description and benefit	
	Modular Messaging—MSS	Modular Messaging—Exchange Modular Messaging—Domino
Future delivery	Subscribers schedule messages for future delivery. The message is kept in the mailbox of the sender and not delivered until scheduled.	Subscribers can schedule messages for future delivery. When subscribers mark a message for future delivery, the message is delivered to the destination Exchange or Domino server immediately. The TUI marks the message with a deferred delivery time before sending it out of the sender's mailbox. The Exchange message transport holds the message internally, hidden from the destination mailbox, until the scheduled delivery time. At the scheduled delivery time, Exchange or Domino delivers the message to the mailbox of the intended recipient. The time stamp on the delivered message shows or announces the time when the sender sent the message and not when the message was delivered to the recipient's mailbox.
System lists and sending restrictions		
Enhanced-List Application (ELA)	An ELA is a system list that enables subscribers to deliver messages to a large number of recipients. Subscribers can address messages to these lists from the TUI and from a computer, or by calling the extension associated with an ELA list.	
Enterprise-wide class of service and sending restrictions	Administrators can prevent the delivery of messages from certain originators to specific groups of mailboxes residing within the Modular Messaging system. Thus, administrators can prevent unwanted enhanced-list usage and unauthorized broadcast message creation. Administrators can also isolate mailboxes that should not receive inbound traffic.	

Table 15: Features and capabilities of Modular Messaging (continued)

Feature and capability	Description and benefit	
	Modular Messaging—MSS	Modular Messaging—Exchange Modular Messaging—Domino
Broadcast messages	<p>Administrators can designate any ELA system list to be a local broadcast list. A subscriber who has broadcast message privileges can send a broadcast message to all local subscribers and to all list members.</p> <p>The Modular Messaging TUIs identify broadcast messages and present new broadcast messages before other messages. The TUIs also announce the number of broadcast messages.</p> <p>Modular Messaging Web Client, Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, and Modular Messaging Lotus Notes Client provide visual indicators for identification of broadcast messages.</p>	<p>Modular Messaging Release 3.1—Exchange will automatically create a broadcast list, Broadcast Distribution List (BDL). Previous releases of Modular Messaging—Exchange allow administrators to create a BDL but did not create it automatically. A subscriber who has access to the broadcast group can send a broadcast message to all local subscribers and to all list members.</p> <p>Modular Messaging—Domino will automatically create and manage a Domino group that consists of all Modular Messaging subscribers in the VMD.</p> <p>Modular Messaging—Domino does not control access to the broadcast group, therefore anyone who knows details regarding the group may send a message to all subscribers.</p> <p>Modular Messaging—Exchange and Modular Messaging—Domino do not differentiate between normal and broadcast messages.</p>
Personal distribution lists (PDLs)		
Creating and managing PDLs	<p>Subscribers can create new PDLs from the Modular Messaging TUIs and from Subscriber Options. Subscribers can modify or delete existing PDLs from the Modular Messaging TUIs, from Subscriber Options, and from Web Subscriber Options.</p>	<p>Subscribers can create new PDLs only from the Modular Messaging TUIs. However, subscribers can modify an Exchange or Domino distribution list to a PDL from Subscriber Options or Web Subscriber Options.</p> <p>Subscribers can modify or delete existing PDLs from the Modular Messaging TUIs, from Subscriber Options, and from Web Subscriber Options.</p>

Table 15: Features and capabilities of Modular Messaging (continued)

Feature and capability	Description and benefit	
	Modular Messaging—MSS	Modular Messaging—Exchange Modular Messaging—Domino
Addressing messages to PDLs	<p>Subscribers can address messages to PDLs from the Modular Messaging TUIs, from Modular Messaging Outlook Client, from Modular Messaging Restricted Outlook Client, from Modular Messaging Lotus Notes Client, from Modular Messaging Web Client, and from any standards-based e-mail client.</p> <p>NOTE:</p> <p>In Modular Messaging Restricted Outlook Client, subscribers can address messages only to PDLs created in Modular Messaging Restricted Outlook Client. However, If Modular Messaging Outlook Client was installed on a system and Modular Messaging Restricted Outlook Client was installed to replace it, the old PDLs are not deleted. Subscribers can address voice messages to these PDLs from Modular Messaging Restricted Outlook Client.</p>	<p>Subscribers can address messages to PDLs from the Modular Messaging TUIs and from Modular Messaging Outlook Client.</p>

Table 15: Features and capabilities of Modular Messaging (continued)

Feature and capability	Description and benefit	
	Modular Messaging—MSS	Modular Messaging—Exchange Modular Messaging—Domino
Message privacy		
Mark Call Answer messages as private	Administrators can configure the system to enable callers to mark Call Answer messages as private. For more information, see Creating private Call Answer messages on page 147.	Administrators can configure the system to enable callers to mark Call Answer messages as private. For more information, see Creating private Call Answer messages on page 147.
Marking and access to private messages	Subscribers can use the Modular Messaging TUIs, Modular Messaging Web Client, and Unified Communication Center (UCC) Speech Access to mark messages as private and to access private messages. With the appropriate privacy settings, subscribers can also use Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, Modular Messaging Lotus Notes Client, and standards-based clients to mark messages as private and to get access to private messages. For more information, see Creating private messages on page 145 and Gaining access to private messages on page 146. Modular Messaging Web Client provides an administrative configuration to support only dual-connect (telephone-playback only) mode. This prevents voice messages from being played locally on the computer, downloading voice messages, and caching voice messaging on the computer.	Subscribers can use the Modular Messaging TUIs and UCC Speech Access to mark messages as private and to access private messages. With the appropriate privacy settings, subscribers can also use Modular Messaging Outlook Client to mark messages as private and to get access to private messages. For more information, see Creating private messages on page 145 and Gaining access to private messages on page 146.

Table 15: Features and capabilities of Modular Messaging (continued)

Feature and capability	Description and benefit	
	Modular Messaging—MSS	Modular Messaging—Exchange Modular Messaging—Domino
Privacy Enforcement Level (PEL) settings	Administrators can use these system-wide privacy parameters to determine which clients support access to messages and the level of privacy these clients enforce. For more information, see The Privacy Enforcement Level parameter on page 148. PEL settings of Full, Partial and Notification Only are supported.	Administrators can use these system-wide privacy parameters to determine which clients support access to messages and the level of privacy these clients enforce. For more information, see The Privacy Enforcement Level parameter on page 148. Modular Messaging—Exchange supports PEL settings of Partial and Notification Only. Modular Messaging—Domino only supports the PEL setting Partial.
Restrict client access	Administrators can use this Class-of-Service (COS) setting to determine if clients are permitted access to messages. For more information, see The Restrict Client Access COS on page 152.	
Backup capabilities		
Backing up and restoring data to and from a DVD	This feature allows administrators to back up and restore critical messaging application server (MAS) and MSS data to and from a backup media, a DVD. This backup media exists in the local DVD-RAM drive installed in the MSS.	This feature allows subscribers to back up and restore critical MAS and Modular Messaging—Exchange data. The customer is responsible for backing up data in a Modular Messaging—Exchange system.
Backing up and restoring data to and from a LAN	This feature allows administrators to back up and restore critical MAS and MSS data to and from a remote storage location on the local area network (LAN) through File Transfer Protocol (FTP) and Secure File Transfer Protocol (SFTP).	

Table 15: Features and capabilities of Modular Messaging (continued)

Feature and capability	Description and benefit	
	Modular Messaging—MSS	Modular Messaging—Exchange Modular Messaging—Domino
Multiple time-zone support		
Setting multiple time zones	<p>Modular Messaging allows time zones to be assigned to subscribers and the messaging system so that features involving time work as expected, even if the subscribers are in a different time zone to the messaging system.</p> <p>Administrators can set the system time zone using the Voice Mail System Configuration application, and they can assign a default time zone to each class of service.</p> <p>Subscribers can assign a specific time zone to their mailbox using Subscriber Options or Web Subscriber Options.</p> <p>The Modular Messaging TUIs accept and assign time based on the Modular Messaging server's time and the subscriber's time zone.</p> <p>Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, Modular Messaging Lotus Notes Client, and standards-based clients will adjust the presentation of time based on attributes defined for the subscriber's computer.</p>	
Security Enhancements, beginning with Modular Messaging Release 3.1		
Role-Based Access Control	<p>Role-Based Access Control (RBAC) gives customers the ability to create administration accounts (logins) on the MSS based on customer-defined roles. Customer-defined roles can be tailored to give each administrator only the access privileges that are needed to perform that administrator's job. When you set up an administrative role, you specify which web-administration pages the role can access and the access type. The access type can be "read and write" or "read only". See the latest Modular Messaging Help for more information.</p>	

Table 15: Features and capabilities of Modular Messaging (continued)

Feature and capability	Description and benefit	
	Modular Messaging—MSS	Modular Messaging—Exchange Modular Messaging—Domino
Authentication of MSS logins using a AAA server	An Authentication, Authorization, and Accounting (AAA) server is an optional, customer-provided server that can be used to authenticate the credentials of administrators logging in to the MSS. The MSS can be configured to use one or two Remote Authentication Dial-In User Service (RADIUS), Lightweight Directory Access Protocol (LDAP), or Active Directory AAA servers to authenticate logins. For RADIUS servers, administration accounts on the MSS that will be authenticated by the AAA server, must also be defined on the AAA server. See the latest Modular Messaging Help for more information.	
Improved logging of administration activity	Information about administration activity on the MSS is always sent to logs on the MSS server. In addition to logging this information locally, for Release 3.1, the MSS can be configured to send logging information to an external, customer-provided server using the syslog protocol (RFC 3164). Only one syslog server can be administered, however, that server can be configured as a syslog relay server that forwards logging information to multiple syslog servers. Logging information stored on the MSS can be viewed using the web-administration interface. See the latest Modular Messaging Help for more information.	

Modular Messaging—Domino

IBM Lotus Domino

In addition to the features described in [Table 14](#), some features and capabilities are specific to the IBM Lotus Domino message stores. [Table 16](#) discusses these features.



Important:

Modular Messaging Release 2 and Release 3 do not support the IBM Lotus Domino message store. All information related to Modular Messaging—IBM Lotus Domino is specific to Modular Messaging Release 1.1 and Release 3.1.

Table 16: Key features and capabilities of Modular Messaging—Domino

Feature and capability	Description and benefit
Voice, fax, and e-mail messages in a single platform of choice – IBM Lotus Domino	
Allows voice, fax, and e-mail messages to be stored in the platform of choice – IBM Lotus Domino.	Provides a single interface for accessing voice mail and corporate e-mail messages.
TUI for accessing, sending, and composing messages	
Receive, respond to, and send messages	Subscribers can receive, reply to, forward, and send voice, fax, text, and corporate e-mail messages over the telephone. Modular Messaging reads corporate e-mail messages and subject headers by using e-mail readers for TTS conversion.
Print messages	Subscribers can print e-mail or fax messages with TIFF attachments.

Text-to-speech conversion capability

Modular Messaging provides a licensed speech synthesis software so that subscribers can hear the envelope and subject information of messages and text names over the telephone through a computer-generated spoken voice.

Modular Messaging uses e-mail readers for TTS conversion. TTS is also used for name confirmation when a recorded name is unavailable.

Multilingual text-to-speech

Microsoft Exchange

IBM Lotus Domino

Subscribers of Modular Messaging—Exchange and Modular Messaging—Domino can hear the contents of their corporate e-mail messages over the telephone by virtue of TTS conversion.

Organizations that receive e-mail in more than one language can enable multilingual TTS. Multilingual TTS identifies the language of e-mail messages and reads them in that language. For more information, see [Table 2](#).

Modular Messaging supports the following TTS engines:

- ScanSoft RealSpeak Telephony 3.5 for all languages that Modular Messaging supports

Modular Messaging provides ScanSoft RealSpeak Telephony 3.5 as the default TTS engine. All new installations of Modular Messaging provide support only to the ScanSoft RealSpeak Telephony 3.5 engine.

Note:

Modular Messaging supports the ScanSoft User Dictionary Editor (UDE) application, to update user dictionaries created using RealSpeak. Generally, the user dictionaries exist in the %SSFTTTSSDK%speech\dictionary\ directory. For information on the steps involved in updating the user dictionaries, see the online help of the UDE application.

- Fonix DECTalk for English conversions and ScanSoft RealSpeak TTS3000 for all non-English conversions

Modular Messaging continues to support Fonix DECTalk and ScanSoft RealSpeak TTS3000 for subscribers who are upgrading from Unified Messenger 5.0. However, Avaya recommends ScanSoft RealSpeak Telephony 3.5 for high-quality TTS conversion.

- Microsoft TTS, for English conversions only

Microsoft TTS is a simple TTS software used only to test the system configuration.

Modular Messaging features

Some considerations related to TTS are:

- Modular Messaging does not permit ScanSoft RealSpeak Telephony 3.5 to be mixed with any other TTS engine in a voice mail domain (VMD).
- TTS services are licensed. The license data applies to the entire VMD *Avaya Modular Messaging Documentation* CD-ROM and specifies the maximum number of concurrent TTS conversions permitted.
- Some subscribers might implement extra security in their Microsoft Exchange or IBM Lotus Domino environments and encrypt each e-mail message. The TTS conversion capability is incapable of reading encrypted e-mail messages.

Simple Network Management Protocol with Modular Messaging

Simple Network Management Protocol (SNMP) is used for the managing and monitoring network elements. The two kinds of SNMP software are a manager, which makes configuration requests and receives notifications, and an agent, which acts on behalf of the managed or monitored element to respond to configuration requests and generate notifications. An SNMP manager is often referred to as a Network Management Station (NMS).

In the Modular Messaging context, the MAS and the MSS are the managed systems that interact with NMSs through SNMP.

SNMP can be used with Modular Messaging to perform the following tasks:

- An NMS can perform queries to retrieve information from an MSS. SNMP is read-only in the Modular Messaging system, which means that an NMS can query an MSS for information, but cannot change that information.
- Modular Messaging (the MAS and MSS) can send alarm information to specified NMSs, using notifications or traps. For more information, see [SNMP alarm notification](#) on page 123.

The Avaya MSS supports SNMP versions 1, 2c, and 3, whereas the MAS supports SNMP versions 1 and 2c.

SNMP system queries

Avaya MSS

The Avaya MSS provides support to SNMP queries from NMSs. When a suitably administered NMS queries an MSS, through SNMP GET requests, the NMS retrieves read-only information defined by Management Information Base - II (MIB-II).

SNMP GET requests are restricted to specifically administered NMSs.

Note:

With Modular Messaging Release 2 and later, the MAS does not provide support for SNMP GET requests. Neither the MAS nor the MSS provides support for SNMP SET requests.

Logs and notifications

Since an MAS runs on a standard Microsoft Windows operating system, several Microsoft Windows tools can be used for monitoring the MAS services, including:

- Windows Performance Monitor to generate statistics and performance information
- Windows Event Log to record and trace significant events

The MAS and the MSS generate system alarm and error logs that you can gain access to by using a command line interface tool. This command line interface tool is called `displot` on the MAS.

Notifications that alarms generate can be sent to any one of the following recipients:

- Avaya Services
- An NMS
- A Business Partner

Note:

Business Partners need access to the Modular Messaging system to receive these notifications.

- Avaya Fault and Performance Manager with use of either Secure Services Gateway (SSG) or Avaya Proxy Agent

Systems can be configured so that these alarm notifications are sent to a service organization either by using a dial-up modem to the Avaya Initialization and Administration System (INADS) or by SNMP traps. The MSS can also use the SNMP to send these notifications to a customer NMS. For details about SNMP traps, see [SNMP alarm notification](#) on page 123.

If the system is configured for INADS alarms, MAS uses its supplied dial-up modem, whereas the MSS uses the Remote Maintenance Board (RMB) to send notifications to INADS.

MAS alarms and logs

Using the command line interface tools supplied with each MAS, administrators can view the following logs:

- The event log, which contains events and errors of interest to only technical services and development personnel

Note:

The event log is not the same as the Windows Event Log.

- The administrator log, which contains events and errors of interest to system administrators

- The active alarms log, which contains information about alarms that are currently active on the system. This log provides a primary tool when problems occur.
- The resolved alarms log, which contains a history of and information about alarms that have been raised and then resolved on the system. This log can be useful in analyzing problems and trends in the system.

For information on configuring serviceability and on displaying event, error, and alarm logs, see the Avaya Modular Messaging, Messaging Application Server administration guides, available on the *Avaya Modular Messaging Documentation* CD-ROM.

MSS alarms and logs

Avaya MSS

The MSS has an application-level maintenance infrastructure that provides automatic error recovery from many software failures. The MSS raises alarms for hardware or software failures for which automatic recovery actions are unsuccessful, and a notification of the alarm condition is sent to Avaya Services. The MSS also monitors each MAS on a regular basis and raises an alarm if an MAS becomes unresponsive for an extended period of time. This extended period of time, known as the time-out value, can be configured and can be set to 0 to disable the time-out.

The MSS hardware platform includes an RMB that autonomously raises an INADS alarm if an MSS processor fails or in response to various environmental problems.

The MSS uses a series of logs that provide a view of activities, errors, and alarms. Reviewing the logs allows a system administrator to reach a quick understanding of overall system status. MSS logs are available from Web-based administration pages.

Logs record events that are useful for preventive maintenance, for diagnosing problems and troubleshooting the server, and for spotting trends or estimating future needs.

Log information is organized as follows:

- Administrator's log, which contains events and errors of interest to system administrators. Administrative events can include problems that directly affect message processing, such as full subscriber mailboxes and undeliverable messages.
- Alarm log, which contains descriptions of all significant problems detected by the system. The alarm log contains active alarms and resolved alarms.
- Maintenance log, which contains descriptions of all reported maintenance events.
- Administration History log, which identifies administrative events that occur on the system. These events include information about any changes to the system, such as logins, command line entries, reports that were run, or changes to software.
- Backup and Restore log. The Backup log informs administrators that a partial unattended backup was successfully completed. When an unattended backup does not successfully occur, the system backs up the System data and as many of the Names and Greetings

and message data types as possible. This is called a partial unattended backup. The Restore log contains a list of all the files that were restored and information about any errors that occurred during the restore. If the restore was not successful, the log contains an explanation of why the restore process failed.

- VM Start-up log. When the system reboots, or when the Messaging software or Voice Module restarts, the system regenerates the VM Start-up Log. The VM Start-up Log provides information about the Messaging software for the following situations:
 - During a restart, the log shows the progress of the restart and information on the state of the Messaging software.
 - During a system update from one software release to the next, the log shows the progress of the data update.
 - During normal system operation, the log provides the last start date of the Messaging software. Note that the Messaging software restart date is not necessarily the same as a system reboot.
- Internet Messaging logs. Most of these logs contain information about the status of each e-mail process.
- Enhanced-List Delivery Failure Log. This log provides information on failed ELA deliveries, and contains the following information:
 - Delivery failure date and time
 - Mailbox number of the originator of each failed message
 - Enhanced-List to which the originator sent the message
 - Last Enhanced-List visited in a nested Enhanced-List hierarchy before the message failed
 - Name of the intended recipient of each failed message
 - Mailbox number of the intended recipient of each failed message
 - Detailed reason for each delivery failure
- Installation and Removal logs. These logs contain information about the installation, update, and removal of software packages.

SNMP alarm notification

Customers can extend their existing SNMP alarm notification functionality to MAS units and to the MSS.

**Important:**

Avaya does not supply NMS units. Subscribers or Business Partners that choose to use SNMP alarm notification with their MAS units and MSS must ensure that NMS is installed, set up, and tested prior to technicians arriving onsite for the Modular Messaging installation or upgrade. The MAS and the MSS communicate with the SNMP NMS.

When an MAS or the MSS enters an alarm state, it can notify service personnel of its alarm state by sending SNMP alarm traps to a predefined NMS. In some SNMP versions, traps are also called notifications or informs.

Modular Messaging can send alarm notifications of major alarms, minor alarms, and warnings:

- To send alarm notifications of major alarms or of major and minor alarms, Modular Messaging sends SNMP traps to Avaya services personnel or Business Partners. These SNMP traps are defined in the Avaya SNMP MIB-II, and convey the following information in its payload:
 - A notification object, `inadssnmpAlarm`, as defined in the Avaya SNMP MIB-II.
 - Two objects, `inadssnmpAlarm Message` and `inadssnmpAlarmTime`, which exist in the payload of `inadssnmpAlarm`. Both `inadssnmpAlarm Message` and `inadssnmpAlarmTime` are defined in the Avaya SNMP MIB-II.
- In addition to sending major and minor alarms through SNMP traps, the MSS can be configured to send traps indicting warnings, major alarms, and minor alarms to one or more additional customer NMSs. These traps are defined in the Avaya OAM MIB. These additional customer NMSs cannot acknowledge receipt of traps.

NMS acknowledgment of the receipt of an SNMP trap

An NMS can acknowledge receipt of an SNMP alarm trap defined in an Avaya SNMP MIB-II with a return trap. With this method, the NMS acknowledges receipt of an alarm trap by returning an SNMP acknowledgment trap. Customers that opt for this method must configure the NMS to generate such return traps.

The objects that the SNMP alarm acknowledgment trap contains are defined in the Avaya SNMP MIB. The SNMP alarm acknowledgment trap conveys the following information in its payload:

- A notification object, `inadssnmpAck`, as defined in the Avaya SNMP MIB.
- `inadssnmpAck` contains two objects in its payload, `inadssnmpAlarmAck` and `inadssnmpAlarmTime`. Both `inadssnmpAlarmAck` and `inadssnmpAlarmTime` are defined in the Avaya SNMP MIB II.

Modular Messaging features

- The value of `inadssnmpAlarmTime` must be the same as that passed in the SNMP alarm trap.
- `inadssnmpAlarmAck` describes whether the manager has successfully received the SNMP alarm trap, or not. `inadssnmpAlarmAck` returns a value of either "so 2" to indicate that it has successfully received the alarm trap or "so 3" to indicate that it has not received the alarm trap.

The MAS and the MSS can also be configured to consider an SNMP trap acknowledged by using a ping surround method. With this method, the MAS and the MSS generate a ping command to the NMS, prior to sending an alarm trap. If the MAS and MSS receive a ping response, they send the trap. If they do not receive a ping response, they keep trying at 5-minute intervals until they receive a response from the NMS, and then they send the trap.

After sending the trap, the MAS and MSS send another ping request. If they receive another ping response from the NMS, the system assumes that the trap was received on the NMS. If the MAS and MSS do not receive another ping response from the NMS, the system assumes that the trap was not sent successfully. The trap is then rescheduled to be sent at 5-minute intervals until it is successfully sent.



Tip:

Avaya encourages customers to use return traps to acknowledge receipt of SNMP traps, as the ping surround method does not actually guarantee that the trap was received.

Licensing

Avaya controls the use and access of some Modular Messaging features through licenses, which the customer must purchase, including:

- The platform the customer wants to use for the message store (Avaya MSS, Microsoft Exchange, or IBM Lotus Domino)
- The number of seats (mailboxes enabled for Modular Messaging) the customer wants to use
- The maximum number of concurrent TTS sessions the customer wants to use

Customers can view the licensing for their systems by using the Licensing utility in the VMSC application.

The license for the number of seats the customer wants to use counts the number of Modular Messaging-enabled mailboxes in the VMD.

With Microsoft Exchange or IBM Lotus Domino message stores, after administrators create mailboxes for subscribers, they must enable Modular Messaging. A subscriber whose mailbox is not enabled for Modular Messaging cannot make use of Modular Messaging features but can still receive voice mail from other voice mail-enabled subscribers.

For Microsoft Exchange or IBM Lotus Domino message stores, the number of e-mail mailboxes may be less than, equal to, or greater than the number of purchased seats. For example, a customer that intends to enable all mailboxes for voice mail and is planning to add subscribers may require fewer e-mail mailboxes than seats. Another example is of a customer that needs only some of the e-mail mailboxes to be voice mail-enabled. In this case, the number of e-mail mailboxes is greater than the number of seats.

In a Modular Messaging—MSS system, the number of mailboxes can be less than or equal to the number of licensed seats.

For more information on viewing license information, see the Avaya Modular Messaging Messaging Application Server administration guides, available on the *Avaya Modular Messaging Documentation* CD-ROM.

Audio encoding formats

Modular Messaging supports the following audio encoding formats:

- Global System for Mobile Communications (GSM) 6.10
- G.711 (A-law and μ -law)

Audio compression manager codecs for GSM 6.10 and G.711 are available on most Windows desktops. Voice messages recorded by using Modular Messaging and sent to non-Modular Messaging users can be played back by using Microsoft Sound Recorder or Media Player on a multimedia computer without any additional software.

The audio encoding format for recording messages is administered on a Voice Mail Domain basis. For information about configuring audio encoding properties, see the MAS Administration Guide.

Some considerations related to audio encoding formats are:

- An MAS can play and record the GSM 6.10, G.711 A-law, and G.711 μ -law audio encoding formats. The single format specified by the VMD setting refers to the format used to record voice messages, recorded names, and greetings by the TUI and GUI clients. The G.711 format is used to record system and Caller Application prompts.
- A message store may contain some messages encoded with GSM 6.10 and some with G.711. This could happen if the encoding is changed, or if networked messages use a different encoder than the one used in the MAS of its VMD. For example, an MSS may receive G.711-encoded messages from the MAS and GSM 6.10-encoded messages from remote subscribers.

Note:

Avaya strongly recommends that administrators revisit the mailbox sizes set for the COSs if the encoding formats of a Modular Messaging system are changed, especially when going from GSM 6.10 to G.711 since G.711 requires more storage space.

GSM 6.10

This audio encoding format has a coding rate of approximately 13 kilobits per second (kbps) or 1.6 Kilobytes per second (KBps). A message that is 1 minute long would require approximately 95.2 KB of storage space when encoded using the GSM 6.10 format. One hour of GSM 6.10 requires 5.6 MB of storage space. GSM 6.10-encoded messages occupy approximately 20% of the storage space used by G.711.

The GSM 6.10 format produces cell phone quality speech. GSM 6.10 is the default encoding format in Modular Messaging.

GSM 6.10 does not support Teletypewriter (TTY).

G.711

This audio encoding format has a coding rate of approximately 64 kbps or 8 KBps. A message that is 1 minute long would require approximately 468.8 KB of storage space when encoded using the G.711 format. One hour of G.711 requires 27.5 MB of storage space. G.711-encoded messages occupy approximately five times as much storage space as GSM 6.10.

G.711 is an international standard telephony encoding format on a 64-kbps channel. G.711 uses the Pulse Code Modulation (PCM) encoding scheme. This is an 8-bit format that is used primarily for telephone quality speech. G.711 has two variants: A-law and μ -law. Typically, A-law is used in Europe, and μ -law is used in the United States.

G.711 encoding produces high-quality recording, which is essential for TTY. Customer systems that use TTY with Baudot tones must use G.711 audio encoding.

G.711 encoding produces higher quality sound. If customers that use GSM 6.10 encoding find that sound quality is inferior, they may consider changing to G.711 encoding for improved sound quality.

Note:

If customers have upgraded from a version of Avaya Unified Messenger Solution that used Rhetorex ADPCM, they can continue to use the Rhetorex ADPCM format. Customers cannot, however, create new voice mail domains that use Rhetorex ADPCM. ADPCM is not available with Dialogic telephony.

Recommendations for selecting audio encoding formats

The voice connectivity between a Modular Messaging system and a switch is dependent on the SWIN used. [Table 17](#) lists the audio encoding format recommended for the various SWINs.

Table 17: Audio encoding recommendation for SWINs

SWIN	Audio Encoding Format
Session Initiation Protocol (SIP)	Modular Messaging negotiates encoding with the switch. However, Modular Messaging currently restricts the acceptable coder and decoder (CODEC) set to G.711 only.
H.323	G.711
T1/E1 QSIG	G.711
Digital Set Emulation (DSE)	Uses the digital encoding method of the switch.

Modular Messaging features

GSM is the default encoding format for Modular Messaging. However, in some situations Avaya recommends or even requires the G.711 encoding format rather than the GSM encoding format. Some considerations related to GSM and G.711 selection:

- G.711 provides the highest quality voice, especially when multiple instances of encoding and decoding are used in the customer's voice network. Voice quality is critical for customers.
- G.711 requires more storage space than GSM. However, encoded message size should not be an issue for customers with LAN connectivity for message playback or for message networking. With G.711 encoding, the MSS-Standard Availability and MSS-High Availability systems provide 1,500 and 3,000 hours of storage, which will be adequate for most customers.
- G.711 encoding is required for Modular Messaging systems that require support for TTY devices.

Note:

For more information about using TTY devices with Modular Messaging, see *Messaging with a Teletypewriter (TTY)*, available on the Modular Messaging documentation CD-ROM.

To use G.711 as the audio encoding format for a system, administrators must set G.711 as the encoding format in the VMSC.

Binary size and MIME transfer size

Avaya MSS

Modular Messaging—MSS stores voice messages in their native binary GSM 6.10 or G.711 format, but uses the base64 encoding scheme to encode audio data when transferring binary messages using Multipurpose Internet Mail Extensions (MIME). A binary message that is base64 encoded occupies about 37% more space than the original binary message. For example, a message that originally occupies 300 KB will occupy about 411 KB after base64 encoding.

When Modular Messaging—MSS subscribers use a standards-based e-mail client to listen to a message, the size of the message displayed by the e-mail client is the MIME transfer size of the message, after base64 encoding. This size includes a 37% increase in size as compared to the original size of the message, regardless of the encoding format used (GSM 6.10 or G.711).

Impacts of message size on message transfer by GUI clients

When subscribers use a GUI client to retrieve a voice message, the entire message may be downloaded to the client.

The size of an encoded message, either GSM 6.10 or G.711 format, and the MIME transfer size of a message affect the time GUI clients take to retrieve and play these messages locally.

However, in a corporate setting, message retrieval takes place on a high-speed LAN, with a speed of 10 MBps or more. Hence, the size difference between the two encoding formats does not noticeably affect message download time.

When subscribers connect to the network remotely by using a 56-Kbps dial-up line, they may have an effective connection speed of 32 Kbps or less. The transfer rate of a GSM 6.10-encoded or G.711-encoded message over such a connection is at the most 4 KBps. Therefore, subscribers actually transfer the binary content of voice messages at a rate of at most 2.9 KBps over such a connection.

Communities and sending restrictions

Avaya MSS

Modular Messaging—MSS has a feature called Sending Restrictions. With appropriate administration, this feature prevents the delivery of messages from certain originators to specific groups of mailboxes residing within the Modular Messaging system. Thus, administrators can prevent unwanted enhanced-list usage, unauthorized message creation, and unwanted messaging, such as delivery from line employees to senior executives, while also isolating mailboxes that should not receive inbound traffic (such as the ELA shadow mailbox).

Use of the Sending Restrictions feature begins with the planning necessary to organize the messaging network's mailboxes into communities. Modular Messaging provides up to 15 communities. You can also think of the communities as classes of restriction. Although these assignments can be changed, Modular Messaging, by default, uses communities 10 and 11 for enhanced-list mailboxes and the ELA shadow mailbox, respectively.

The communities must be defined equivalently everywhere within the messaging network as messaging systems include each mailbox's community assignment when exchanging directory updates. For networked messaging systems that do not possess facilities to assign communities to its subscribers, Modular Messaging has an administration field, configurable on a per-networked system basis, to allocate a community number to all the remote system's mailboxes. An administrator can uniformly assign a community number to all Internet originators who send e-mail to the Modular Messaging system's mailboxes.

Once the communities are defined, the administrator should identify unwanted message transmission paths and configure each Modular Messaging system with the same sending restrictions matrix. Message transmission between any two communities may be freely open, restricted in one direction or the other, or restricted in both directions. Modular Messaging systems arrive preconfigured to restrict all traffic into the community in which the ELA shadow mailbox resides.

Community numbers are given to Modular Messaging local subscribers on a per-subscriber basis. They are independent of COS assignments. Administrators may need to change the community assignments for some subscribers or networked systems that have already been administered to achieve the desired results. Administrators should assign appropriate community numbers to subscribers or networked machines that are added in the future. Modular Messaging allows definition of a default community number. The default community is assigned to a new local subscriber unless the administrator selects a different value during the subscriber addition.

The Modular Messaging server enforces community-based sending restrictions at delivery time. Feedback is not given when addressing a message to a destination that the system does not allow the originator to reach. However, for each unreachable destination, the originator will receive a delivery failure notice stating that messaging to the intended recipient was not permitted. This behavior produces uniformity between the TUIs and the graphical clients.

Sending restrictions do not affect directory lookup services available to subscribers. When subscribers address or perform lookups based on name or number, results will include entries

to which sending may be restricted. Community-based sending restrictions may not be suitable to partition a Modular Messaging system for multitenant applications, as entries for other tenants will appear in a given tenant's addressing and lookup results.

A common configuration for community-based sending restrictions is to allow only selected individuals to use very large enhanced lists or broadcast lists. To do so, the administrator assigns the privileged persons into their own community and then modifies the restrictions matrix to prevent all other communities from sending into the community housing the list mailboxes.

System lists

This topic provides information on the system lists that Modular Messaging supports.

Modular Messaging—MSS Enhanced-List Application

Avaya MSS

ELA is a messaging tool that greatly expands the capability of the Modular Messaging—MSS system to deliver messages to a large number of recipients. ELA associates one mailbox to a list of members, so that when subscribers want to send a message to the whole list, they can send a message to the list mailbox instead.

When a new message is delivered into the list mailbox, known as the shadow mailbox, the ELA software distributes the message to the members of the list. ELA members can be local or remote subscribers or arbitrary e-mail addresses, thus providing extreme flexibility. For example, administrators can set up an ELA list for a suggestion box that messages addressed to this list are distributed to the Modular Messaging mailboxes of a set of subscribers and to one or more e-mail addresses, for archiving or any other purpose.

Ordinarily, recipients receive the message as if it were sent by the message originator. Recipients can reply to the person who originally sent the message and to all recipients of the original message. However, administrators can configure lists to block recipients from replying to ELA senders or recipient lists. In this case, the shadow mailbox must belong to a community that cannot receive messages, but can send messages to all other communities. For more information on sending restrictions and communities, see [Communities and sending restrictions](#) on page 130.

An ELA mailbox is like any other mailbox, allowing such operations as recording a name and a greeting for the list and allowing Call Answer messages to be distributed through ELA. As any other mailbox does, an ELA mailbox has a mailbox number, a numeric address, and a Modular Messaging e-mail address. The actual addressing format used to send the message to the list mailbox can be any addressing format that the relevant interface (TUI or computer interface) supports.

Administrators of Modular Messaging—MSS can also administer a remote mailbox with the e-mail address of a list, thus making Microsoft Exchange and IBM Lotus Domino lists available through Modular Messaging—MSS configurations.

A Modular Messaging—MSS system supports a maximum of 1,000 ELA lists; each ELA list can have a maximum of 1,500 members. ELA lists can be nested to create larger lists.

Modular Messaging—Exchange global distribution lists and Modular Messaging—Domino mailing list groups

Microsoft Exchange

IBM Lotus Domino

Microsoft Exchange and IBM Lotus Domino systems support system lists, known as global distribution lists and mailing list groups, respectively.

A global distribution list is a group of e-mail addresses that are grouped under a single e-mail address. A distribution list provides an easy way to send messages to a group of people. A message sent to a distribution list goes to all recipients of the list.

Microsoft Exchange supports global distribution lists that are visible in the Global Address List and are available to everyone who uses that network.

IBM Lotus Domino supports mailing list groups that are visible in the IBM Lotus Notes Address Book and are available to everyone on that Domino Domain.

Broadcasting messages

Avaya MSS

With Modular Messaging—MSS, an administrator can designate any ELA to be a local broadcast list. When a message is received into an appropriately configured enhanced-list mailbox, the message is sent to all local subscribers and to all list members.

Modular Messaging—MSS administrators can also set up system-wide or enterprise-wide broadcast lists. For example, administrators can create a broadcast list on each Modular Messaging system and then create a broadcast list on one of the Modular Messaging systems that has as its members the broadcast lists on all the systems.

The MSS uses the broadcast mailbox and Community ID settings to control sending privileges of users who address messages to ELA broadcast mailing lists. For more information on communities and sending privileges, see [Communities and sending restrictions](#) on page 130.

The actual addressing format used to send a broadcast message can be any addressing format that the relevant interface (TUI or computer interface) supports.

Although a new broadcast message does not activate MWI, it does activate Call Me and Notify Me, provided that the broadcast message meets subscriber-specified criteria. If customers require MWI activation, system administrators can create an ELA list with entries for each local subscriber. Messages sent to an ELA list activate MWI.

The Modular Messaging TUIs announce broadcast messages. The TUIs present new broadcast messages before other messages and provide a summary count of broadcast messages after subscribers log in. AUDIX TUI and Serenade TUI subscribers hear all broadcast messages of all message types (voice, fax, and text) before gaining access to other messages. Aria TUI subscribers hear all voice broadcast messages before accessing other voice messages but have to select the text message option to be able to listen to broadcast text messages. If broadcast messages are sent as text, Aria TUI users will not hear the messages unless they access text messages.

Modular Messaging Web Client, Modular Messaging Lotus Notes Client, Modular Messaging Restricted Outlook Client, and Modular Messaging Outlook Client provide visual indications for identifying broadcast messages.

Standards-based clients do not provide any special visual indicators for broadcast messages. Recipients can recognize broadcast messages from the address of the broadcast ELA, unless the broadcast message has been sent through Blind Carbon Copy (BCC).

Microsoft Exchange

Modular Messaging Release 3.1—Exchange will automatically create a broadcast list, Broadcast Distribution List (BDL). Previous releases of Modular Messaging—Exchange allow administrators to create a BDL. When a new message is sent to the list, the BDL distributes the message to the members of the distribution list.

Recipients of the broadcast message receive the message as if it were sent by the message originator. Recipients can reply to the person who originally sent the message. However,

administrators can configure the distribution lists to block recipients from replying to broadcast messages.

Subscribers of Modular Messaging—Exchange can use the Active Directory settings to control sending privileges of users who address messages to the broadcast distribution list. The actual addressing format used to send a broadcast message can be any addressing format that the relevant TUI supports.

Modular Messaging—Exchange does not provide differentiation between normal and broadcast messages, therefore there will be no indication from the TUIs or the clients that a message was sent as a broadcast. Likewise, a new broadcast message will activate Call Me, Notify Me, and the MWI provided that the message meets subscriber-specified criteria.

IBM Lotus Domino

Modular Messaging—Domino will automatically create a Domino group that includes all Modular Messaging enabled subscribers. Modular Messaging—Domino will also ensure that the group is properly updated whenever subscribers are enabled or disabled.

Modular Messaging—Domino does not provide differentiation between normal and broadcast messages, therefore there will be no indication from the TUIs or the clients that a message was sent as a broadcast. Likewise, a new broadcast message will activate Call Me, Notify Me, and the MWI provided that the message meets subscriber-specified criteria.

Additionally, Modular Messaging—Domino will not control access to the broadcast group. Any subscriber who knows how to access the group will be able to send a message to all of the subscribers.

Personal Distribution Lists

A Personal Distribution List (PDL) is a labeled collection of addresses that a subscriber may create and save for later use. Messages that are addressed to the list are sent to all of the addresses (list members) within the list. Subscribers who frequently send messages to the same group of people can create a PDLs for the groups. For example, if a subscriber frequently sends messages to 10 members of the Sales team, the subscriber can create a PDL labeled "Sales" that has the addresses of the 10 members of the Sales team. When the subscriber sends a message to the PDL "Sales," the message is sent to all 10 members of the Sales team.

Unlike system lists, such as an ELA or a broadcast distribution list, a PDL is created and managed by a subscriber rather than a system administrator. Unlike an ELA or a broadcast distribution list, a PDL is personal, meaning that only the owner of the list can view and use the list. A PDL is not available for other subscribers.

For more information on system lists, distribution lists, and ELA, see [System lists](#) on page 132.

Modular Messaging supports up to 500 PDLs per subscriber, subject to system capacity, although no hard limit has been established for the product. A PDL can contain up to 999 members (list entries), subject to system capacity, although no hard limit has been established for the product.

Note:

Lists are not subscribers and do not count toward any purchasable limits.

PDL members

The entries in a PDL are known as PDL members. A PDL can contain one or more of the following entries as list members:

- Addresses of local or remote subscribers
- Fax machine telephone number
- ELA lists on local or remote systems (applicable only to Modular Messaging—MSS)
- Enterprise lists on a Message Networking server
- Other PDLs owned by the same subscriber
- Any arbitrary e-mail address

A PDL may not contain the broadcast mailbox, the internal fax delivery mailbox, or the Modular Messaging—MSS ELA shadow mailbox.

Note:

Subscribers can also create a PDL with no addresses and then add addresses later. The format for adding addresses to a PDL depends on the client or interface that subscribers use. For more information, see [Creating PDLs from TUIs](#) on page 138 and [Creating PDLs from Subscriber Options or Web Subscriber Options](#) on page 139.

PDL labels and identifiers

A PDL has one or more of the following labels or identifiers:

- Name
- Identifier
- List number (List ID)
- Recorded list name

Name

A Name, also known as the PDL display name, is a Unicode text name that subscribers can assign a PDL. A PDL Name can contain a maximum of 255 characters.

Subscribers can use the PDL Name when addressing messages from the Modular Messaging TUIs. When managing PDLs from Subscriber Options or Web Subscriber Options, subscribers can use the PDL Name to quickly navigate through the PDLs they own.

A PDL Name can contain alpha, alphanumeric, and restricted characters. A PDL Name need not be unique.

In Modular Messaging—MSS, when creating PDLs from Subscriber Options and Web Subscriber Options, subscribers must assign PDL Names. When creating PDLs from the Modular Messaging TUIs, subscribers cannot assign PDLs a Name. However, subscribers can use Subscriber Options or Web Subscriber Options to modify the PDL and assign it a Name.

Identifier

An Identifier is an ASCII name that is assigned to PDLs. When subscribers enter a name for their PDLs, the system automatically generates an Identifier for the PDL. A system-generated Identifier is the PDL Name without any spaces or restricted characters. For example, the Identifier of a PDL named Sales Team (3) would be SalesTeam3.

Subscribers can also edit the system-generated Identifier, if required. An Identifier can contain only ASCII characters (0 to 9, a to z, A to Z, _ and -) and must be unique across all the PDLs a subscriber owns. If subscribers do not provide an Identifier, the system automatically generates an Identifier.

The Identifier is used in the PDL e-mail address syntax #[Identifier]@hostdomain.com, when subscribers address messages to a PDL from a GUI client.

List number (List ID)

A List number, also known as the List ID, is a numeric list identifier that subscribers must assign to PDLs they own. A List number must be unique among all PDLs that the subscriber owns.

A List number can contain 1 to 32 digits and can start with 0. If a PDL contains a single list member, the 7-digit telephone number of that list member can be used as the List number. The List number is used in the PDL e-mail address syntax `#[List number]@hostdomain.com`, when subscribers address messages to a PDL from a GUI client.

Subscribers can also use the List number to address messages to a PDL from the Modular Messaging TUIs. A PDL that exists must have a List number.

Recorded list name

A recorded list name is an optional identifier that subscribers can record when creating lists from the Modular Messaging TUIs, from Web Subscriber Options, or from Subscriber Options.

Working with PDLs

Subscribers can create and manage, which includes modifying or deleting, PDLs from the following interfaces or clients:

- The Modular Messaging TUIs:
 - Aria TUI for Modular Messaging
 - AUDIX TUI for Modular Messaging
 - Serenade TUI for Modular Messaging
- Subscriber Options
- Web Subscriber Options

PDLs that subscribers create by using one client or interface are usable from any other client or interface. For example, PDLs that subscribers create by using the Aria TUI for Modular Messaging are usable from the AUDIX TUI for Modular Messaging, from the Serenade TUI for Modular Messaging, and from the GUI clients.

Creating PDLs from TUIs

From the Modular Messaging TUIs, a subscriber can create new PDLs with one or more of the following members:

- Local subscribers. Local subscribers can be added by mailbox number, Numeric Address, or name.
- Remote subscribers. Remote subscribers can be added by Numeric Address, network address, or name.

- Fax device telephone numbers

The Modular Messaging AUDIX TUI and Modular Messaging Serenade TUI support adding a fax device telephone number to a PDL. However, Modular Messaging Aria TUI does not.

- ELA lists (applicable only to Modular Messaging—MSS)
- List numbers (List IDs) of other PDLs that the same subscriber owns

Note:

Subscribers can create a PDL with no members and add entries later.

When subscribers create a PDL from the TUIs, the PDL has no text Name. Subscribers can provide a Name later from Subscriber Options or Web Subscriber Options, after the PDL is created. When subscribers create a PDL from the TUIs, they can also provide a recorded name.

Creating PDLs from Subscriber Options or Web Subscriber Options

Avaya MSS

From the Subscriber Options or the Web Subscriber Options applications, a subscriber can create new PDLs. When creating a PDL from Subscriber Options or Web Subscriber Options, subscribers assign the PDL a text Name and a List number. Subscribers can also edit the system-generated Identifier and provide an optional recorded name.

For Modular Messaging—MSS, PDLs may be created with one or more of the following members:

- The mailbox numbers or Numeric Addresses of subscribers from Global Contacts.
- The extension numbers of local subscribers from Global Contacts.
- The names of subscribers from Global Contacts. When subscribers enter the name or partial name of subscribers from Global Contacts, Subscriber Options or Web Subscriber Options presents a list of matches, if any. Subscriber Options and Web Subscriber Options present up to nine matches for the specified name.
- Fax device telephone numbers in the format fax=nnnn@host.domain, where host.domain is the address of the subscriber's MSS.
- Arbitrary e-mail addresses.
- Text Names of other PDLs that the same subscriber owns.

Note:

Subscribers can create a PDL with no members and add entries later.

Note:

From the Subscriber Options and Web Subscriber Options for the Restricted Outlook Client, a subscriber cannot add a non-subscriber to a PDL.

Microsoft Exchange

IBM Lotus Domino

In Modular Messaging—Exchange, subscribers can create distribution lists using Microsoft Outlook. In Modular Messaging—Domino, subscribers can create groups using Lotus Notes.

Subscribers can use Subscriber Options or Web Subscriber Options to allow a distribution list or group to be accessed as a PDL from the TUIs. Any Modular Messaging TUI can be used to add members to a PDL; this cannot be done using Subscriber Options or Web Subscriber Options.

Managing PDLs from the TUIs

Managing a PDL from the Modular Messaging TUIs includes:

- Adding and removing list members by specifying their mailbox numbers, Numeric Addresses, network addresses, or display names
- Modifying the List number of the PDL
- Adding or modifying the recorded name of the PDL
- Deleting a PDL

To manage a PDL, subscribers can select the PDL by specifying its List number or its Name. If the PDL Name contains only non-ASCII characters, the only way to select a PDL is by its List number.

Managing PDLs from Subscriber Options or Web Subscriber Options

Managing a PDL from Subscriber Options or Web Subscriber Options includes:

- Modifying the List number or identifier of the PDL
- Adding or modifying the recorded name of the PDL
- Deleting a PDL
- Adding and removing list members by specifying their mailbox numbers, Numeric Addresses, extension numbers, or e-mail addresses (applicable only to Modular Messaging—MSS)

To manage a PDL, subscribers can select the PDL by specifying its List number or its Unicode Name. The PDL Name enables subscribers to quickly navigate through the PDLs they own. From Subscriber Options, subscribers can sort PDLs by Name or by List number.

An administrator can invoke Subscriber Options or Web Subscriber Options on behalf of a subscriber, enabling the administrator to access lists that the subscriber owns.

Addressing messages to PDLs

Subscribers can address messages to PDLs from any of the following interfaces, applications, or clients:

- The Modular Messaging TUIs:
 - Aria TUI for Modular Messaging
 - AUDIX TUI for Modular Messaging
 - Serenade TUI for Modular Messaging
- Modular Messaging Outlook Client
- Modular Messaging Restricted Outlook Client (applicable only to Modular Messaging—MSS)
- Modular Messaging Lotus Notes Client
- Modular Messaging Web Client (applicable only to Modular Messaging—MSS)
- UCC Speech Access client
- A standards-based e-mail client

If subscribers address a message to a PDL that contains a deleted subscriber or a deleted PDL, the system generates a delivery failure notification message. The message is delivered to all other valid recipients. The system also informs the message originator of the last known name and e-mail address of the deleted subscriber or PDL. The TUIs voice the e-mail address by using TTS conversion. For more information, see [PDLs and deleted subscribers](#) on page 144.

Addressing from the Modular Messaging TUIs

The Modular Messaging TUIs enable subscribers to include a PDL in the addressee list when addressing messages.

To address messages to a PDL from the Modular Messaging Aria TUI or the Modular Messaging Serenade TUI, subscribers can address to the List number or to the Name, if one exists.

With these TUIs, PDLs belonging to a subscriber are mixed in with addresses of other subscribers. When subscribers address a message to the List number of a PDL, the system matches the number against all PDLs belonging to the subscriber, as well as mailbox numbers, Numeric Addresses, and network addresses of other subscribers. When subscribers address a message by name, the system matches the name against the names of PDLs belonging to the subscribers, as well as display names of subscribers.

The system prompts the subscribers to select the targeted recipient, which in this case is a PDL.

Subscribers of Modular Messaging AUDIX TUI can address to a PDL either by Name, if one exists, or by List number. The TUI provides subscribers an opportunity to select the PDL from a list of matches. The Modular Messaging AUDIX TUI provides subscribers with a unique key

press when addressing messages to PDLs. This key press identifies the PDL address type, thus keeping PDL addresses separate from addresses of other subscribers.

Addressing from GUI clients

Subscribers can address messages to a PDL from any of the following GUI clients:

- Microsoft Outlook, with Modular Messaging Outlook Client and Modular Messaging Restricted Outlook Client (applicable only to Modular Messaging—MSS)

Note:

In Modular Messaging Restricted Outlook Client, subscribers can address messages only to PDLs created in Modular Messaging Restricted Outlook Client. However, If Modular Messaging Outlook Client was installed on a system and Modular Messaging Restricted Outlook Client was installed to replace it, the PDLs created in Modular Messaging Outlook Client are not deleted. Subscribers can address voice messages to these PDLs from Modular Messaging Restricted Outlook Client.

- IBM Lotus Notes, with Modular Messaging Lotus Notes Client
- Modular Messaging Web Client (applicable only to Modular Messaging—MSS)
- Standards-based e-mail client

From all these GUI clients, subscribers can address messages either to the List number or to the PDL Identifier.

When subscribers address messages to a PDL from Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, or Modular Messaging Lotus Notes Client, the Voice Form component provides directory assistance. Subscribers can select a PDL recipient from the MSS directory and conveniently send a message to the list. All PDLs that a subscriber owns are grouped under Modular Messaging PDLs, in the MSS directory.

In Modular Messaging—MSS Release 3 and later, Modular Messaging Web Client facilitates subscribers to look up PDL addresses. Subscribers thus do not need to know the address of a PDL. In Modular Messaging Web Client, subscribers also have an option of addressing a message to selected members of a PDL. Subscribers can select individual members by expanding the PDL.

Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, Modular Messaging Lotus Notes Client, and Modular Messaging Web Client support the following PDL addressing formats:

- #nnnn, where nnnn is the List number of the PDL. Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, and Modular Messaging Lotus Notes Client resolve this address to a PDL from the list of PDLs belonging to the subscriber. Modular Messaging Web Client expands this address to mailboxnumber#nnnn@host.
- #asciichars, where asciichars is the Identifier of the PDL. Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, and Modular Messaging Lotus Notes Client resolve this address to a PDL from the list of PDLs belonging to the subscriber.

Modular Messaging Web Client expands this address to mailboxnumber#asciichars@host.

Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, Modular Messaging Lotus Notes Client, and Modular Messaging Web Client also support addressing formats as an Internet Messaging Access Protocol 4 (IMAP4) standards-based e-mail client. These addressing formats are:

- mailboxnumber#nnnn@host, where mailboxnumber is the local mailbox number of the subscriber and nnnn is the List number of the PDL.
- handle#nnnn@host, where handle is the handle (part to the left of the @ symbol) of the subscriber's e-mail address and nnnn is the List number of the PDL.
- mailboxnumber#asciichars@host, where mailboxnumber is the local mailbox number of the subscriber and asciichars is the Identifier of the PDL.
- handle#asciichars@host, where handle is the handle (part to the left hand side of @) of the subscriber's e-mail address and asciichars is the Identifier of the PDL.

Note:

When using the list Identifier, the match against the PDLs belonging to the subscriber is not case sensitive.

Addressing from UCC Speech Access client

When addressing messages to a PDL from the UCC Speech Access client, subscribers can, through speech, request a PDL List number. The List number can have a maximum length of four digits. Alternatively, subscribers can add the e-mail address of the PDL to their Personal Contacts.

Other PDL addressing concepts

Other concepts related to PDL addressing are:

Circular PDLs

A circular PDL directly or indirectly includes itself. A message addressed to a circular PDL is delivered to the union of all individual members, other than PDLs on each of the PDLs. Each recipient receives the message only once.

Consider the example of a subscriber who owns two PDLs—PDL1 and PDL2. PDL1 has subscriber A, subscriber B, and PDL2 as its members and PDL2 has subscriber B, subscriber C, and PDL1 as its members. A message addressed to either PDL1 or PDL2 is delivered to subscriber A, subscriber B, and subscriber C, and all three subscribers receive the message only once.

A circular PDL has unlimited levels of nesting.

When creating a PDL with Modular Messaging—Domino, inclusion of a list within itself is not permitted.

PDLs and deleted subscribers

If a subscriber addresses a message to a PDL that has deleted subscribers or deleted PDLs among its members, the system delivers a delivery status notification (DSN) to the subscriber. This DSN informs the subscriber of a problem with list expansion. The message is delivered to all other valid recipients.

The DSN informs the subscriber of the list that has deleted members and also includes the last known text name and e-mail address of the deleted members. The TUIs voice the e-mail address using TTS conversion.

Regardless of the number of deleted subscribers in the targeted PDL, the subscribers receive only one DSN that informs them of a problem in the targeted PDL. However, a subscriber receives as many DSNs as the number of PDLs with deleted subscribers. For example, if a subscriber sends a message to a PDL that has other PDLs—PDL A and PDL B, each containing deleted subscribers—the originating subscriber receives 2 DSNs: a DSN informing of problems with PDL A and another DSN informing of problems with PDL B.

PDL address not visible to recipients

When subscribers send a message to a PDL from the Modular Messaging TUIs, Microsoft Outlook with Modular Messaging Outlook Client and Modular Messaging Restricted Outlook Client, IBM Lotus Notes with Modular Messaging Lotus Notes Client, or Modular Messaging Web Client, recipients cannot see the address of the PDL.

The message that the recipient receives shows only the addresses of individual subscribers within the PDL and not the address of the PDL itself. Even when a PDL contains other PDLs, recipients see only the addresses of individual subscribers.

If a PDL is copied on a message using BCC, provided that BCC is available to the sending client, the recipient sees neither the PDL itself nor any of the PDL members.

Message Privacy

Modular Messaging uses a two-pronged approach to achieve message privacy:

- Flexible support for message privacy

This includes the ability to create, send, and access private messages from the Modular Messaging TUIs and from Avaya GUI clients. It also includes the restrictions that these clients and interfaces impose on the recipients of private messages. The support that Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, Modular Messaging Lotus Notes Client, and standards-based e-mail clients provide is subject to the enforced privacy parameters.

- Enforcement of message privacy

This includes privacy parameters that administrators can configure using the VMSC tool on a MAS and on the Avaya MSS.

System administrators can set the levels of privacy support and privacy enforcement. These administered levels also determine the behavior of user interfaces and clients, with respect to privacy.

Note:

Modular Messaging does not restrict recipients of private messages from playing the messages on a speakerphone or recording the message with a tape recorder. Likewise, Modular Messaging does not restrict recipients of private fax messages or private messages with attachments from printing and then circulating the fax or attachments. Modular Messaging cannot restrict the operation of programs that subscribers may use to view private message attachments.

Creating private messages

When creating new messages, subscribers can mark messages as private from the following interfaces, clients, or applications:

- Modular Messaging TUIs:
 - Aria TUI for Modular Messaging
 - AUDIX TUI for Modular Messaging
 - Serenade TUI for Modular Messaging
- Modular Messaging Web Client (applicable only to Modular Messaging—MSS)
- UCC Speech Access
- Microsoft Outlook with Modular Messaging Outlook Client and Modular Messaging Restricted Outlook Client (applicable only to Modular Messaging—MSS)

Modular Messaging features

- IBM Lotus Notes with Modular Messaging Lotus Notes Client
- Standards-based e-mail clients

Standards-based e-mail clients support creating private messages only if the client uses the standard RFC822 privacy or sensitivity message header. Modular Messaging treats private, confidential, or personal messages originating from a standards-based e-mail client as private messages.

Callers can create private messages when using the Avaya Common Caller Interface (CCI) to leave Call Answer messages, provided that administrators have configured the system to allow private Call Answer messages. For more information, see [Creating private Call Answer messages](#) on page 147.

While creating private messages, consider the following:

- Marking a message as private indicates the sender's intent that the message be treated in a confidential manner and makes it difficult for the recipient to easily forward the message. However, there is no guarantee that the recipient will not rerecord the voice content of a message or play the message through a speakerphone.
- Messages with attached faxes or files can be marked as private, but there are no restrictions on viewing, printing, or distributing files that are attached to such messages.

Gaining access to private messages

Modular Messaging supports subscribers access to private messages as follows:

- When subscribers gain access to a private message from any of the Modular Messaging TUIs, the TUI announces that the message is private before playing the message. Depending on the PEL setting, the TUIs may restrict subscribers from forwarding private messages or from replying to private messages with the original message attached. For more information, see [The Privacy Enforcement Level parameter](#) on page 148.
- When subscribers gain access to a private message from the Modular Messaging Web Client application, the application provides a visual indicator for private messages. Regardless of the administered PEL setting, Modular Messaging Web Client restricts subscribers from forwarding private messages or replying to the sender of a private message with the original message attached.

Note:

When subscribers play a voice message locally on the computer, they have the option to save the voice file on the computer. In addition, Windows Media Player also caches the voice file on the computer. To enforce maximum privacy, administrators can configure Modular Messaging Web Client to support only dual-connect mode. This prevents voice messages from being played locally on the computer, downloading voice messages, and caching voice messaging on the computer.

- When subscribers gain access to a private message from the UCC Speech Access client, the client announces that the message is private. The UCC Speech Access client restricts subscribers from forwarding private messages or from replying to private messages with the original message attached.
- In Modular Messaging—MSS, subscribers can use Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, Modular Messaging Lotus Notes Client, and IMAP4 standard-based e-mail clients to gain access to mailboxes only if:
 - The PEL parameters are not set to Full.
 - The Restrict Client Access COS is set to No.

Note:

These clients do not enforce privacy restrictions. If subscribers want voice mail privacy operation, administrators can prevent specific subscribers or all subscribers from using these clients by using the Restrict Client Access COS and the PEL setting, respectively.

When subscribers access private messages from Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, or from Modular Messaging Lotus Notes Client, the application provides a visual indicator for the messages. However, the application does not enforce privacy so subscribers are allowed to forward the message or reply to the message with the original attached. Subscribers can also save the message using the Save As feature.

Standard IMAP4 clients may provide a visual indicator for private messages, provided that the client recognizes the standard RFC822 privacy or sensitivity message header. Typically, these clients may not enforce privacy; that is, they may not restrict subscribers from replying to private messages with the original message attached, forwarding, or saving messages.

Creating private Call Answer messages

The VMSC tool on the MAS provides an administrative setting that determines whether a caller can leave private Call Answer messages. If this setting (Allow Private Call Answer Messages) is enabled, callers that reach the Avaya CCI can mark Call Answer messages as private.

This administrative setting is independent of the PEL parameters. For more information, see [The Privacy Enforcement Level parameter](#) on page 148.

If this setting is disabled, callers will not be able to leave private messages. However, subscribers will still be able to create new private messages when composing messages from the TUI, GUIs, or UCC Speech Access.

The Privacy Enforcement Level parameter

Administrators can control the level of privacy the system enforces by administering the PEL parameter. The PEL privacy parameter setting determines which clients or interfaces have access to Modular Messaging mailboxes. Depending on the PEL parameter setting, clients and interfaces may or may not restrict subscriber attempts to forward private messages or reply to private messages with the original message attached.

PEL is a system-wide parameter with the values Full, Partial, and Notification Only, where Full is the default value. The value of this privacy parameter determines the level of privacy the system enforces.

Note:

Modular Messaging—Exchange supports only Partial and Notification Only values for the PEL parameter. Modular Messaging—Domino supports only Partial for the PEL parameter.

The PEL parameter does not affect the Allow Private Call Answer Messages parameter.

Full privacy enforcement

Avaya MSS

This is the default setting for new Modular Messaging—MSS installations.

Note:

Modular Messaging—Exchange and Modular Messaging—Domino do not support Full privacy enforcement.

If the value of the PEL system parameter is set to Full, the Modular Messaging system enforces privacy to the fullest extent possible.

With this setting, subscribers can access their mailboxes by using only the following interfaces or clients:

- Modular Messaging TUIs
- Modular Messaging Web Client
- UCC Speech Access

When the PEL parameter is set to Full, these interfaces and clients also enforce privacy to the maximum extent possible; subscribers cannot forward private messages or reply to private messages with the original message attached.

In addition, with this setting, the system prevents subscribers from sending private messages to arbitrary e-mail addresses.

When Modular Messaging subscribers send private messages to users of remote messaging systems connected to a Message Networking server, the following actions occur:

- Private messages sent to Intuity AUDIX, Octel 250/350, and Octel 200/300 are delivered as private.
- The Message Networking server provides an option to either allow or block sending private messages to an Audio Messaging Interchange Specification (AMIS) end node. If this option is set to block private messages from being sent to an AMIS end node, private messages are rejected. If this option is set to allow private messages to be sent to an AMIS end node, the message is sent to the AMIS recipient with an earcon indicating Private appended to the start of the message. AMIS remote subscribers cannot send private messages.
- Voice Profile for Internet Mail (VPIM) support of privacy is optional. Private messages sent through a Message Networking server to a VPIM end node are sent as private. However, the ability of the receiving node to identify the message as private and offer any restrictions is a function of the capabilities of that end node. If a VPIM subscriber sends a private message and it is delivered to Message Networking marked as private, the Modular Messaging recipient receives it marked as private, subject to the Modular Messaging privacy restrictions.

Note:

When the PEL parameter is set to Full, subscribers cannot access their mailboxes using either standards-based clients, Modular Messaging Lotus Notes Client, Modular Messaging Restricted Outlook Client, or Modular Messaging Outlook Client. The Full privacy enforcement setting overrides the Restrict Client Access COS setting.

Partial privacy enforcement

If the value of the PEL system parameter is set to Partial, subscribers can access their mailboxes by using the following interfaces or clients:

- Modular Messaging TUIs
- Modular Messaging Web Client (applicable only to Modular Messaging—MSS)
- UCC Speech Access
- Modular Messaging Outlook Client
- Modular Messaging Restricted Outlook Client (applicable only to Modular Messaging—MSS)
- Modular Messaging Lotus Notes Client
- Standards-based clients

Note:

In Modular Messaging—MSS, mailbox access through Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, Modular Messaging Lotus Notes Client, and standards-based clients is determined by the Restrict Client Access COS setting.

With this setting, the TUIs, Modular Messaging Web Client, and UCC Speech Access enforce privacy; subscribers cannot forward private messages or reply to private messages with the original message attached. However standards-based clients, Modular Messaging Lotus Notes Client, and Modular Messaging Outlook Client may not restrict subscriber attempts to forward private messages or reply to private messages with the original message attached.

Notification Only privacy enforcement

This is the default setting for upgrades from earlier releases of Modular Messaging—MSS.

If the value of the PEL system parameter is set to Notification Only, subscribers can access their mailboxes by using the following interfaces or clients:

- Modular Messaging TUIs
- Modular Messaging Web Client (applicable only to Modular Messaging—MSS)
- UCC Speech Access
- Modular Messaging Outlook Client
- Modular Messaging Restricted Outlook Client (applicable only to Modular Messaging—MSS)
- Modular Messaging Lotus Notes Client
- Standards-based clients

Note:

In Modular Messaging—MSS, mailbox access through Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, Modular Messaging Lotus Notes Client, and standards-based clients is determined by the Restrict Client Access COS setting.

With this setting, although the TUIs allow subscribers to mark messages as private, they do not enforce privacy of messages. The TUIs announce messages as being private but do not enforce restrictions on forwarding of private messages and on replying to a private message with the original message attached.

Modular Messaging Web Client and the UCC Speech Access client always enforce privacy, regardless of the PEL setting; subscribers cannot forward private messages or reply to private messages with the original message attached.

TUI privacy announcement

The announcements that the Modular Messaging TUIs play when subscribers access private messages depend on the PEL setting:

- If the PEL setting is Full or Partial, the TUIs play an announcement indicating that the message is private. Subscribers cannot dial through this announcement.
- If the PEL setting is Notification Only, the TUIs play a non-dial-through privacy announcement, followed by a dial-through announcement indicating that the sender has requested that the message be treated as private.

Restricting client access to mailboxes

Avaya MSS

Modular Messaging—MSS provides administrative settings to control subscriber access to mailboxes from clients that use IMAP4 or Post Office Protocol 3 (POP3) standards.

Note:

Restrict client access to mailbox feature is supported only in Modular Messaging—MSS. Modular Messaging—Exchange does not support the Restrict client access to mailbox feature or the Full privacy enforcement parameter.

Enabling or disabling POP3 and IMAP4 services

The Avaya Message Storage Server (MSS) provides administrators the facility to enable or disable IMAP4 and POP3 services.

When the IMAP4 service is disabled, subscribers cannot use any IMAP4 clients to access the Modular Messaging system. This includes Modular Messaging Web Client, UCC Speech Access, the Modular Messaging Outlook Client application, the Modular Messaging Restricted Outlook Client application, the Modular Messaging Lotus Notes Client application, or any IMAP4 standard-based e-mail clients.

When the POP3 service is disabled, subscribers cannot use POP3 standard-based e-mail clients to access their Modular Messaging mailboxes.

When the IMAP4 and POP3 services are enabled, IMAP4 and POP3 standards-based clients can access Modular Messaging, subject to the Restrict Client Access COS and the PEL setting. For more information, see [The Privacy Enforcement Level parameter](#) on page 148.

The Restrict Client Access COS

Administrators can use a Class-of-Service (COS) privacy parameter to enable or restrict client access to Modular Messaging mailboxes. This COS, known as the 'Restrict Client Access' COS determines whether subscribers using that COS can use an IMAP4 or POP3 standards-based client to access their Modular Messaging mailboxes.

This Restrict Client Access COS has values of Yes and No.

Subscribers can access their mailboxes from standards-based e-mail clients, from Modular Messaging Lotus Notes Client, from Modular Messaging Restricted Outlook Client, and from Modular Messaging Outlook Client only when the Restrict Client Access COS parameter is set to No.

The Restrict Client Access COS does not affect the behavior of the Modular Messaging telephone user interfaces (TUIs) and Modular Messaging Web Client; these clients will continue to have access to the Modular Messaging mailboxes, even when the COS is set to Yes.

For new installations of Modular Messaging, the COS value is set to Yes by default. For upgrades from existing systems, the COS value is set to No by default.

Note:

The Restrict Client Access to Mailbox COS is not relevant when the Privacy Enforcement Levels (PEL) parameter is set to Full. When the PEL parameter is set to Full, the system operates as if all COS have the Restrict Client Access setting of Yes.

Standard RFC822 Privacy Header

Modular Messaging supports the standard RFC822 sensitivity header for privacy. This allows subscribers using standards-based clients to mark outgoing messages as private. Depending on the capabilities of the client, incoming messages may also be identified as 'private'. Typically, these clients do not prominently display the privacy indicator. These clients may not enforce any privacy restrictions with respect to forwarding private messages.

Summary of the privacy parameters

[Table 18](#) summarizes the roles and interdependencies of the different parameters that enforce and support message privacy in Modular Messaging—MSS systems:

Table 18: Interdependencies of the privacy parameters

PEL	Feature ability with private messages	TUI	Web Client	UCC Speech Access	Modular Messaging Outlook Client ¹	Modular Messaging Restricted Outlook Client ¹	Modular Messaging Lotus Notes Client ¹	IMAP4 clients ¹	POP3 clients ¹
Full	Forward	No	No	No	When the PEL setting is full, clients cannot access the mailbox ¹ . Modular Messaging—Exchange does not support Full PEL setting or the Restrict client access to mailbox feature				
	Reply/Reply All	Yes	Yes	Yes					
	Reply/Reply All with Original	No	No	No					
	Copy Message	NA	No ²	NA					
	Copy Message Contents	NA	No ²	NA					
Partial	Forward	No	No	No	Yes	Yes	No	The Partial PEL setting is available. However, the feature ability is dependent on the client settings.	
	Reply/Reply All	Yes	Yes	Yes	Yes	Yes	Yes		
	Reply/Reply All with Original	No	No	No	Yes	Yes ³	Yes		
	Copy Message	NA	No ²	NA	Yes	Yes ³	No		
	Copy Message Contents	NA	No ²	NA	Yes	Yes ³	No		

Table 18: Interdependencies of the privacy parameters (continued)

PEL	Feature ability with private messages	TUI	Web Client	UCC Speech Access	Modular Messaging Outlook Client ¹	Modular Messaging Restricted Outlook Client ¹	Modular Messaging Lotus Notes Client ¹	IMAP4 clients ¹	POP3 clients ¹
Notification Only	Forward	Yes	No	No	Yes	Yes		The Notification Only PEL setting is available. However, the feature ability is dependent on the client settings.	
	Reply/Reply All	Yes	Yes	Yes	Yes	Yes	Yes		
	Reply/Reply All with Original	Yes	No	No	Yes	Yes ³	Yes		
	Copy Message	NA	No ²	NA	Yes	Yes ³			
	Copy Message Contents	NA	No ²	NA	Yes	Yes ³			

1. If PEL is Full, or if Restrict Client Access is Yes, then the client cannot access the mailbox. The message privacy enforcements listed in the column apply only if PEL is not Full and Restrict Client Access is No.

2. The Modular Messaging Web Client interface does not provide an option to save or copy the private message or the content of the private message. However, subscribers can press CTRL+C to copy the message or its content to another file.

3. Applicable only to e-mail messages.

[Table 19](#) summarizes the roles and interdependencies of the different parameters that enforce and support message privacy in Modular Messaging—Exchange and Modular Messaging—Domino systems:

Table 19: Interdependencies of the privacy parameters

PEL	Feature ability with private messages	TUI	Web Client	UCC Speech Access	Modular Messaging Outlook Client	Modular Messaging Lotus Notes Client	IMAP4 clients	POP3 clients
Partial	Forward	No	No	No	Yes	No	The Partial PEL setting is available. However, the feature ability is dependent on the client settings.	
	Reply/Reply All	Yes	Yes	Yes	Yes	Yes		
	Reply/Reply All with Original	No	No	No	Yes	Yes		
	Copy Message	NA	No ¹	NA	Yes	No		
	Copy Message Contents	NA	No ¹	NA	Yes	No		
Notification Only	Forward	Yes	No	No	Yes		The Notification Only PEL setting is available. However, the feature ability is dependent on the client settings.	
	Reply/Reply All	Yes	Yes	Yes	Yes	Yes		
	Reply/Reply All with Original	Yes	No	No	Yes	Yes		
	Copy Message	NA	No ¹	NA	Yes			
	Copy Message Contents	NA	No ¹	NA	Yes			

1. The Modular Messaging Web Client interface does not provide an option to save or copy the private message or the content of the private message. However, subscribers can press CTRL+C to copy the message or its content to another file.

Setting time zones

Modular Messaging supports the multiple time zones feature that enables administrators to select and assign time zones to a group of subscribers within a single system or VMD. This feature is beneficial in centralized switching and messaging configurations, where subscribers may reside in different time zones than that of the Modular Messaging system, for example, in branch offices.

Time zones can be set at the system (VMD), COS, and subscriber levels.

The Modular Messaging system uses the system time zone as the default for date and time presentation to all subscribers using:

- Modular Messaging TUIs
- Subscriber Options
- Web Subscriber Options

The multiple time zones feature allows administrators to set time zones on a COS basis. For subscribers within the vicinity of the Modular Messaging system, administrators can assign a COS that uses the system time zone. For subscribers located far away from the message store, administrators can set up and assign a COS that uses a time zone specific to the location of the subscribers.

The system time zone is the default time zone for every COS. Administrators can administer the time zone on the MSS, for Modular Messaging—MSS systems, and on the VMSC, for Modular Messaging—Exchange and Modular Messaging—Domino systems.

The multiple time zones feature also allows subscribers to assign a different time zone to their mailboxes. This setting overrides the time zone assigned to the COS. Other than groups of subscribers in decentralized locations, the multiple time zones feature also allows the following subscribers to assign the time zone of their current location to the mailbox:

- Virtual office subscribers
- Subscribers who are traveling

Subscribers can use Subscriber Options or Web Subscriber Options to assign a specific time zone to a mailbox.

Internal to Modular Messaging, all time values, such as message timestamps and schedule times, are stored in Coordinated Universal Time (UTC). The time zone attribute is used to convert the internal UTC into the specific time zone presented to each subscriber. This applies to all subscriber visible events, including but not limited to:

- Receipt time for messages
- Future delivery time for messages
- Schedules for Call Me, Notify Me, and Find Me

Changing a subscriber's time zone attribute changes only the presentation of time values to the subscriber, not the internal UTC of the corresponding event.

Modular Messaging TUIs use the time zone to adjust times for displaying the message receipt time or for scheduling future message delivery. Similarly, Modular Messaging Web Clients use the time zone attributes from Modular Messaging rather than those of the subscriber's computer.

Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, Modular Messaging Lotus Notes Client, and standards-based clients will adjust the presentation of time based on attributes defined for the subscriber's computer.

Modular Messaging also provides time zone adjustments for fax cover sheets and fax delivery status notifications.

Caller Application schedules are not adjusted by the time zone settings. The schedules use the time zone of the MAS running the Caller Application Editor.

Backup capabilities

Avaya MSS

Modular Messaging allows administrators to back up critical MAS and MSS data. If a system failure occurs, administrators can use the backed up data to restore data to the servers. Administrators can back up data either to a backup media in the local DVD-RAM drive installed in the MSS or to a remote storage location on the LAN through FTP and SFTP.

Note:

In Modular Messaging—Exchange, the backing up and restoring of the MAS and the Exchange message store data is the responsibility of the customer.

Modular Messaging provides two kinds of backup, attended and unattended.

In attended backups, MAS and MSS data are backed up manually to a DVD or to a remote storage location. Administrators can perform attended backups to do the following:

- Back up large amounts of data.
- Create backups before shutting down for a repair or upgrade.
- Create backups after changing subscriber profiles.
- Create backups after recording additional subscriber names.

For example, administrators can back up voice messages and other voice data by using an attended backup. Modular Messaging also allows administrators to back up only selected data types of the servers. The following three data types can be backed up during an attended backup:

- System data, such as enabled features, installed software, networking connectivity and communication information, mailing lists, options enabled for subscribers, and voiced subscriber named recording
- Voiced subscriber names
- Greetings and messages

Modular Messaging systems can also back up system-critical information automatically on a regular basis. These automatic system backups are called unattended backups. Unattended backups can save the following MSS data:

- Detailed system data on shared memory
- Speech file system pointers
- Alarm management information
- List of enabled features
- List of installed software
- Networking connectivity and communication information

- Message headers
- Mailing lists
- Subscriber profiles
- MWI status
- Hard disk configuration
- Voiced subscriber names, if there is space
- Messages and greetings, if there is space

Note:

Depending on the subscriber's system, some of the MSS data may not be backed up.

Unattended backups save the following MAS data:

- Data needed by the operating system, such as system state information, operating system registry, and Active Directory information base
- Messages that are not yet submitted for delivery
- MAS Caller Applications
- Hosts file
- Customized prompts file

The unattended backup contains all information required to bring a system back to an operational state after a service-affecting event. By default, unattended backups are scheduled to automatically start at 3:00 a.m., local time, every day. In Release 3 and later, Modular Messaging allows administrators to modify the scheduled start time, on the MSS.

The Modular Messaging system generates backup logs for the attended and unattended backups. The backup logs contain the following information:

- Start and end time
- Type of backup
- Amount of backup data
- Backup progress information
- Information regarding all abnormal situations, if any

Administrators can view the backup logs to verify whether a backup was successful or not.

Modular Messaging also provides a Web-based user interface to back up and restore data. Using the Web-based interface, administrators can do the following:

- Set up a configuration of an unattended backup, including the backup type.
- Perform an attended backup.
- Select data to be restored from all backups done for that system.

- Perform a restore.

For more information on backup and restore of MAS data, see *Avaya Modular Messaging Release 3 Messaging Application Server Administration Guide for Avaya Modular Messaging with the Avaya MAS and MSS*.

Backing up and restoring data from a DVD

Modular Messaging—MSS provides a DVD-RAM medium to back up data. If a system failure occurs, the data stored on the DVD-RAM can be used to restore the system back to an operation state.

Administrators can perform an attended full-system backup of MAS and MSS data on the DVD-RAM. During a full backup, multiple DVD-RAM media can be used for backing up the data.

Administrators can also configure the Modular Messaging system to perform unattended backup of critical data to the DVD-RAM. Administrators can view the backup logs to verify whether the unattended backup was successful or not. If an unattended backup is unsuccessful, the Modular Messaging system raises alarms to notify the administrator. An unattended backup to a DVD-RAM will be unsuccessful if the following occurs:

- Required backup media is not in the DVD-RAM drive.
- Media is placed upside down in the drive.

During an unattended backup, if there is not enough space for the backup, the backup is considered to be partially successful. Partially successful backups do not raise alarms. However, the system labels the backup as partially successful in the backup logs.

The DVD-RAM medium provided by the MSS can hold approximately 4.7GB of data. During an unattended backup, if more than one DVD-RAM is required for backing up data or offsite storage of data is required, it is recommended to back up data on the LAN.

If a system failure occurs, administrators can restore the backed-up MAS and MSS data from the DVD-RAM manually. MSS data can also be restored when any one of the following events occurs:

- Alarm repair action prompts to perform a restore.
- The MSS stops operating and will not boot.

Modular Messaging allows subscribers either to restore the complete backed up data or to restore only selected data types.

Backing up and restoring data from a LAN

In Release 3 and later, subscribers can back up MAS and MSS data on a remote storage location on the LAN through FTP or SFTP. LAN backups facilitate disaster-recovery planning and provide the ability to make a complete backup for large systems with many subscribers and their messages. If a system failure occurs, the backup data stored on the remote storage location of the LAN is used to restore the system to an operation state.

Backup considerations

Backing up the MAS and MSS data to a remote storage location requires a customer-provided FTP or SFTP server on the customer LAN. During a LAN backup of data, the Modular Messaging system creates a new file for the backup on the remote storage server. The backup file name consists of the system name, the backup type, and the date and time when the backup is performed.

Subscribers can back up data to the LAN, using either the FTP or the SFTP data transfer protocol. By default, SFTP will be the data transfer protocol for Modular Messaging—MSS LAN backups.

If a subscriber opts to use the FTP to transfer the files being backed up to the specified remote location, the subscriber must enter a password for authentication.

The SFTP server also allows only authenticated subscribers to perform LAN backups through the SFTP. Modular Messaging uses a public cryptographic key for authentication between the MSS and the remote SFTP server. The public cryptographic key authentication is more secure than password authentication.

Administrators can perform an attended or unattended backup of MAS and MSS data on the LAN. Modular Messaging also allows administrators to specify the scheduled start time and expected completion time for unattended LAN backups.

If an unattended backup is unsuccessful, the Modular Messaging system raises alarms to notify the administrator. An unattended backup to a LAN will be unsuccessful if the following occurs:

- The connection to the remote storage server was unsuccessful.
- Not enough space is available for the backup.

The Modular Messaging system also raises an alarm when a LAN backup process takes longer than the expected completion time specified by the administrator.

Time and bandwidth considerations

During a full backup of a message store, LANs with low bandwidth take a longer time to back up data. LAN backup time is dependent on the throughput of the corporate LAN and the remote storage server used.

Modular Messaging features

If full backups are required, use either the S3500 or the newer S3400 motherboard. These motherboards have a 1 Gbps Ethernet port. The Gigabit LAN infrastructure reduces the time to back up or restore data.

Storage space calculation

The following formula estimates how much space one night's LAN backup requires, based on the number of subscribers, their average number of messages and greetings (measured in minutes), and the system's audio encoding format.

Space used each night = $100\text{MB} + 0.05\text{MB} \cdot (L+R) + (0.1\text{MB} \cdot M \cdot L \cdot F)$

where:

- MB represents a unit of megabytes.
- L is the number of local subscribers existing on the system that night.
- R is the number of remote subscribers existing on the system that night.
- M is the average number of minutes of messages per mailbox.
- F equals 1 if the system uses GSM encoding, and F equals 5 if the system uses G.711 encoding.

For example: a G.711 system with 2,000 local subscribers with 5 minutes of messages/greetings and 50,000 remote subscribers would occupy approximately

$$= 100\text{MB} + 0.05\text{MB} \cdot (2000+50000) + (0.1\text{MB} \cdot 5 \cdot 2000 \cdot 5)$$
$$= 100 \text{ MB} + 2600 \text{ MB} + 5000 \text{ MB}$$
$$= 7.7 \text{ GB.}$$

Restore considerations

If a system failure occurs, administrators can restore the backed up MAS and MSS data from the LAN manually. Modular Messaging allows subscribers either to restore the complete backed up data or to restore only selected data types, such as system data, voiced subscriber names, and greetings and messages.

A disaster recovery procedure for a system backed up using LAN includes the following steps:

- Reloading the system
- Configuring the network
- Configuring the system to use the LAN backup or restore storage server
- Restoring the system state

Subscriber data migrations and system upgrades

Modular Messaging supports the migration of the following systems to Modular Messaging—MSS Release 3.1:

From	To	Default subscriber TUI
Aria 2.0, Aria 3.0, and Aria 3.1	Modular Messaging—MSS, Release 3.1	Modular Messaging Aria TUI
Intuity AUDIX R5.0, R5.1, R4.4, Intuity AUDIX HiCap, and Intuity AUDIX LX		Modular Messaging AUDIX TUI
Serenade 3.0 and later		Modular Messaging Serenade TUI

Note:

Subscriber data migrations are a value-added service that Avaya Global Services and trained Channel Partners provide to Modular Messaging—MSS Release 3. Avaya advises customers to contact the appropriate organization to facilitate this service.



Tip:

For migration of networking subscriber information to a new or existing Message Networking Server, see the document 'Network management for subscriber migrations to Modular Messaging', available at <http://www.avaya.com/support>.

For subscriber data migrations, the following are included:

- Any applicable system data. Most system values are set as part of the installation and not via migration.
- Any applicable COS data.
- Any applicable subscriber mailbox data.
- Any system distribution lists on Aria systems. These system distribution lists are migrated to Modular Messaging ELA lists.

Note:

System distribution lists on Aria systems that include remote subscribers are not migrated.

For subscriber data migrations, the following are not included:

- Messages
- Greetings

Modular Messaging features

- Names
- Customer-modified system prompts and announcements
- Automated Attendant mailboxes and applications
- PDLs

Modular Messaging supports upgrading the following systems:

From	To	Default subscriber TUI
Modular Messaging—MSS, Release 1.1	Modular Messaging—MSS, Release 3.1	Modular Messaging Aria TUI
Modular Messaging—Exchange, Release 1.1	Modular Messaging—Exchange, Release 3.1	Modular Messaging Aria TUI
Modular Messaging—Domino, Release 1.1	Modular Messaging—Domino, Release 3.1	Modular Messaging Aria TUI
Modular Messaging—MSS, Release 2	Modular Messaging—MSS, Release 3.1	Currently assigned TUI
Modular Messaging—MSS, Release 3.0	Modular Messaging—MSS, Release 3.1	Currently assigned TUI
Modular Messaging—Exchange, Release 3.0	Modular Messaging—Exchange, Release 3.1	Currently assigned TUI

Some considerations related to upgrading of Modular Messaging systems are:

- Systems that are initially configured with all Modular Messaging Aria TUI mailboxes that later deploy the Modular Messaging AUDIX TUI must be engineered at that time to meet the capacities noted in [Table 29](#) or [Table 30](#).
- System upgrades to Modular Messaging Release 3.1 with the addition of a Modular Messaging AUDIX TUI or Modular Messaging Serenade TUI require engineering of the MAS port capacities if the system meets each of these guidelines:
 - Uses S3400 hardware
 - Is currently configured with Modular Messaging Aria TUI
 - Has more than 30 ports
- Upgrades are done by service personnel, not by the customer.
- Upgrades of Modular Messaging—MSS pre-Release 3 to Modular Messaging—MSS, Release 3.1 require upgrading the Linux operating system to Red Hat Enterprise Linux (RHEL), Version 4.
- Upgrades of Modular Messaging servers, such as MAS, Modular Messaging Web Client server, and Tracing Server, to Modular Messaging, Release 3 servers requires upgrading

the Windows operating system to Windows 2003 Server Application Kit with Service Pack 1 (SP1).

Note:

For customer-provided Modular Messaging servers, subscribers must upgrade the Windows operating system to Windows 2003 Standard Edition with SP1.



Important:

In Modular Messaging Release 3, separate computers recommended for installing the Modular Messaging services, will be known as Supplementary Servers. Such servers were referred to as Tracing Server in the previous releases of Modular Messaging.

- Upgrades to Modular Messaging—MSS, Release 3.1 do not require upgrades to the Modular Messaging clients. Similarly, upgrades of Modular Messaging clients do not require upgrading to Modular Messaging, Release 3.1.

Note:

Modular Messaging—MSS, Release 3.1 is compatible only with the Modular Messaging clients of Release 2 and Release 3. For earlier releases of Modular Messaging clients, Avaya recommends that clients are also upgraded during the upgrade of the Modular Messaging system.

- For Modular Messaging, Release 3.1, the MSS S3400 server must be replaced with the S3500 server if either (or both) of the following conditions exists for the customer's Modular Messaging system, that is for the Voice Mail Domain (VMD):
 - More than 2000 mailboxes
 - More than a total of 40 ports (regardless of the number of MAS servers)
- Upgrades of MAS on the S3400 server platform, to Modular Messaging, Release 3.1 is supported only if the MAS contains 48 or fewer ports. If an MAS contains more than 48 ports, perform any one of the following tasks:
 - Move the extra ports on to additional MAS
 - Upgrade the MAS to S3500 server platform
- Upgrades of Modular Messaging—Domino, Release 1.1 to Release 3.1 requires that the S3400 hardware be replaced with S3500 hardware.

The following systems must be upgraded to Modular Messaging Release 1.1 prior to upgrading to Modular Messaging, Release 3.1:

- Unified Messenger for Microsoft Exchange, Release 5.0 to Modular Messaging—Microsoft Exchange, Release 1.1
- Modular Messaging—MSS, Release 1.0 to Modular Messaging—MSS, Release 1.1

Modular Messaging also allows the upgrade of Unified Messenger for IBM Lotus Domino, Release 5.0 to Modular Messaging—Domino, Release 1.1.

Modular Messaging features

Note:

Earlier releases of Unified Messenger must be upgraded to Unified Messenger Release 5.0 prior to upgrading to Modular Messaging, Release 1.1.

Chapter 5: Offline Messaging

This chapter provides a description of how a Avaya Modular Messaging system responds when one or more components go offline. It also provides an explanation of how users can access messages when a component is in the offline mode.

This chapter includes the following topics:

- [Messaging with message store in offline mode](#) on page 168
- [Messaging with e-mail clients in offline mode](#) on page 172

Messaging with message store in offline mode

When a message store is in the offline mode, Modular Messaging supports offline messaging in the following scenarios:

- Offline Call Answer
- Offline access to Call Answer messages
- Peer Failover
- Domino Clustering

Offline Call Answer

If a message store server is not reachable, Modular Messaging continues to provide basic Call Answering functions to callers. Callers can continue to leave voice messages or fax messages for subscribers. With Modular Messaging—Microsoft Exchange and Modular Messaging—IBM Lotus Domino, if the message store is offline, the messaging application server (MAS) continues to transfer fax calls to the third-party fax server. If the third-party fax server is offline, the MAS will hang up the call when the fax server does not answer.

From the caller's point of view, operation is close to normal, with a significant difference being that subscribers' greetings are not available and are replaced by a prerecorded phrase "Please leave a message for..." followed by the recorded name of the subscriber. If subscribers do not have a recorded name, the system plays a text-to-speech (TTS) rendition of the subscriber's display name.

Under these circumstances, some features such as Call Me, Notify Me, Message Waiting Indicator (MWI), and certain Caller Applications are not available or may be delayed until the message is actually delivered.

When operating in an offline mode, the MAS queues any new Call Answer messages in a local store until the message store server is online. The MAS also queues Notify Me messages for delivery.

Once the MAS re-establishes connection with the message store server, Modular Messaging delivers accumulated Call Answer messages and Notify Me messages to the message store server. Call Me and MWI are activated for queued messages after the delivery of the accumulated messages.

With Modular Messaging—Microsoft Exchange, the behavior varies depending on which message store servers are unavailable. Modular Messaging uses a configured Exchange server (or one of a list of configured failover servers) to handle most requests, but subscriber mailboxes can be hosted on other Exchange servers. The three scenarios and outcomes related to Exchange server availability include:

- If the primary Exchange server (or one of its configured failover servers) and the Exchange server that hosts the subscriber's mailbox are both available, then calls will be answered normally.
- If the primary Exchange server (or one of its configured failover servers) is available, but the Exchange server that hosts the subscriber's mailbox is not available, then the system will greet the caller with "Please leave a message for..." rather than the subscriber's greeting. Delivery will be attempted for any message that is left.
- If none of the required Exchange servers are available, then Modular Messaging will answer calls in offline mode, as described above.

Offline access to Call Answer messages

Using the Modular Messaging Offline Access (OLA) feature, subscribers can access new Call Answer messages even when the message store is in the offline mode. If a message store server is not reachable, the MAS continues to queue any new Call Answer messages in a local store until the message store server comes up or online.

Subscribers can use the Common Offline Access telephone user interface (TUI) to access their Call Answer messages, regardless of the TUI assigned to them. This TUI is limited, providing options only to retrieve and listen to new Call Answer messages. Subscribers will not have complete control of their mailbox. Subscribers cannot use this TUI to access other sources of messages such as from local or networked subscribers, broadcast, Enhanced-List Application (ELA), Enterprise Lists, Delivery Status Notifications, and so on, or to change message state, delete, forward, or reply to messages. The system informs subscribers that the TUI offers limited services.

With Modular Messaging—Microsoft Exchange, messages are transferred from the MAS local store to the Exchange Message Transfer Agent (MTA) as long as the primary Exchange server (or one of its failover servers) is available. The Exchange server that hosts the subscriber's mailbox does not have to be available to Modular Messaging. The Exchange MTA queues each message for delivery for up to 72 hours (by default), attempting delivery before returning it with a non-delivery receipt.

Note:

For Modular Messaging—Microsoft Exchange systems, at least one Exchange 2007 server acting as the Hub must be available for messages to be delivered to the recipient. If no Hub server is available in the Active Directory site, messages will be submitted from Modular Messaging but queued within Exchange. Modular Messaging will not necessarily switch to offline mode (or failover) and the queued message will not be delivered.

With Modular Messaging—Avaya Message Storage Server (MSS), subscribers also have offline TUI access to recently received fax messages. Although fax messages cannot be printed during offline access, header information is available, including the page count and ANI information from the sender's fax machine. In addition, subscribers can review any attached voice message.

Offline Messaging

In a multi-MAS voice mail domain, each MAS migrates copies of Call Answer messages in its local store to a common repository known as the Offline Call Answer Store.

Note:

During offline access, as the MAS does not have access to the time zone setting of the subscriber, the timestamp on the message may be unpredictable.

The Offline Call Answer Store acts as a repository for Call Answer messages taken for all subscribers in the voice mail domain, in the last x number of hours. The value of x is 24 by default, but can be changed to any value from 1 to 99, subject to disk capacity. If the message store is continuously offline for more than x hours, the messages are retained until the message store comes back online and they can be delivered.

If the disk capacity available to the Offline Call Answer Store is completely filled with Call Answer messages, offline access is automatically disabled. Once offline access is disabled, no more messages are stored in the Offline Call Answer Store.

Queued messages remain in the Offline Call Answer Store until they roll off the MAS. Thus, when subscribers use the TUI to access Call Answer messages in offline conditions, they may hear messages that they had deleted earlier, when the message store was online.

When subscribers use the Common Offline Access TUI, the Call Answer messages stored in the Offline Call Answer Store are copied to the local store for playback access.

If the MAS is not able to reach the Offline Call Answer Store, subscribers will not be able to log in to their mailboxes.

Note:

Offline Call Answer and TUI Access to Offline Call Answer Messages are capabilities intended to provide partial service in rare instances of failures and not to compensate for an unreliable infrastructure.

Peer Failover

Microsoft Exchange

When Avaya Modular Messaging—Exchange is installed initially, an MAS is configured to have a single Microsoft Exchange server to handle message processing for subscribers. This Exchange server is known as the primary peer server. The primary peer server of the first MAS installed in the Voice Mail Domain (VMD) will host the VMD object itself and is known as the VMD Host. Each MAS in the system configuration has an assigned primary peer server, although all MAS units may share the same primary peer server. Each MAS must be able to communicate with the VMD Host.

System administrators can identify and configure additional peer servers within the voice mail domain that can handle messaging on behalf of subscribers if the primary peer server fails. Thus, if the primary peer server for an MAS fails, the MAS can search for another peer server to allow messaging to continue. Each MAS in the system is assigned its own list of non-primary

peer servers for backup. Servers that are candidates to become the peer server if the primary peer server becomes unavailable are known as failover peer servers.

In Modular Messaging—Exchange system, when an MAS detects that the current peer Exchange server (primary peer) is not accessible, the MAS attempts to establish communication with another Exchange server to act as the peer. This feature is known as Peer Failover and can be enabled by using the Voice Mail System Configuration application.

When the primary peer server is online again, the MAS waits for a stipulated period of time. In the stipulated period, if the MAS is idle and the primary peer server continues to be online, the MAS attempts to return service to the primary peer server. This feature is known as Fail Back.

When a Microsoft Exchange e-mail server is offline, Call Answer and subscriber access to Call Answer messages take place as described in [Offline Call Answer](#) on page 168 and [Offline access to Call Answer messages](#) on page 169.

For information on configuring the system to continue messaging when the Microsoft Exchange server goes offline, see the *Avaya Modular Messaging Release 3 Messaging Application Server Administration Guide for Avaya Modular Messaging with Microsoft Exchange or IBM Lotus Domino*.

Domino Clustering

IBM Lotus Domino

When an IBM Lotus Domino message store is offline, Call Answer and subscriber access to Call Answer messages take place as described in [Offline Call Answer](#) on page 168 and [Offline access to Call Answer messages](#) on page 169.

However, creation and sending of new messages and other aspects of messaging are not available when an IBM Lotus Domino message store is offline. When an MAS fails repeated attempts to access an IBM Lotus Domino message store because it is offline, the Modular Messaging TUI terminates the session.

Customers can achieve a high level of redundancy by homing subscribers on Domino clusters.

A Domino cluster comprises two or more Domino servers that mirror each other's data. If one of the servers in the cluster fails, Domino clients (including the messaging subsystem used by the TUI) are seamlessly switched to another server in the cluster. This allows the Domino message store to run at a higher level of overall availability, since nodes in the cluster can be taken down without significantly affecting clients. In practice, this is all transparent to the TUI.

In an Avaya Modular Messaging—Domino environment, mailboxes and directories are stored in IBM Lotus Domino databases. Within a Domino cluster, replicas of mailboxes and directory databases are continuously synchronized. If a primary database is not available, the MAS units fail over to a replica within the cluster.

Messaging with e-mail clients in offline mode

Modular Messaging—MSS (with Modular Messaging Outlook Client and Modular Messaging Lotus Notes Client), Modular Messaging—Exchange, and Modular Messaging—Domino all support offline messaging sessions.

With offline messaging, subscribers can have messages from their message store synchronized with a local file on their computer so they have access to those messages when they are not connected to the network or message store. Subscribers can listen to, reply, forward, and compose new voice messages from their multimedia computer. New messages remain in the outbox until the next time subscribers are connected to the message store.

With Modular Messaging—Exchange and Modular Messaging—Domino, all messages (new and opened) are included in the offline message file. Modular Messaging Outlook Client and Modular Messaging Lotus Notes Client for Modular Messaging—MSS caches copies of messages on the local computer after a message is opened.

Thus, only messages opened at least once by using Modular Messaging Outlook Client or Modular Messaging Lotus Notes Client will be available for offline messaging with Modular Messaging—MSS. The MSS directory is available only when connected to the MSS. Offline subscribers can address messages by entering the full address, copying from messages in their inbox or folders, or selecting from personal contacts where subscribers have recorded the MSS address of recipients.

Any messages copied to a local or network folder (personal or public) are available for replay in offline mode.

Chapter 6: Addressing and networking

This chapter introduces the interoperability of Avaya Modular Messaging with other voice mail systems and the different forms of addressing that Modular Messaging supports.

This chapter includes the following topics:

- [Addressing](#) on page 174
- [Multiple mailboxes and alias extensions](#) on page 186
- [Networking](#) on page 188

Addressing

Each Modular Messaging mailbox is assigned the following addresses that can be used to address messages from the Modular Messaging telephone user interface (TUI) and from a desktop computer:

- Primary mailbox address
- Local mailbox number
- Numeric Address

Note:

For information on addressing messages to Personal Distribution Lists (PDLs), see [Addressing messages to PDLs](#) on page 141.

For addressing from Unified Communication Center (UCC) Speech Access, see the UCC Speech Access documentation at <http://www.avaya.com/support>.

Primary mailbox address

Modular Messaging uses the mailbox number and a standard e-mail address as the primary addresses for subscriber mailboxes.

In most voice mail systems, the primary mailbox address is the mailbox number. Modular Messaging also associates an e-mail address with each mailbox:

- In a Modular Messaging—Avaya Message Storage Server (MSS) system, the e-mail address is of the form `firstname.lastname@msshost.company.com`, where `msshost.company.com` is the Domain Name System (DNS) name of the MSS and can be replaced with an e-mail host alias name. For more information, see [Other networking considerations for Modular Messaging—MSS](#) on page 175.

Note:

This e-mail address cannot be the same as the subscriber's corporate e-mail address, as this is the address of the subscriber's MSS mailbox and not of the subscriber's corporate e-mail mailbox.

- In Modular Messaging—Microsoft Exchange and Modular Messaging—IBM Lotus Domino systems, the e-mail address is the subscriber's corporate e-mail address. Typically, this address is of the form `firstname.lastname@company.com`.

The different interfaces of Modular Messaging, such as the TUI and the graphical user interfaces (GUIs), support different forms of addressing. All these addressing forms are effectively aliases of either the mailbox number or the e-mail address. Internally, Modular Messaging always delivers messages to an e-mail address and always identifies the sender with an e-mail address.

When Modular Messaging sends messages, such as those sent through SMTP/MIME networking or those sent by the Notify Me feature, the sender's name and the e-mail address of the sender's Modular Messaging mailbox appear in the from field of the message. With Modular Messaging—Exchange and Modular Messaging—Domino, this name and address are the sender's corporate e-mail identity. With Modular Messaging—MSS, these are the name and e-mail address for the sender's Modular Messaging mailbox and, although the name might be the same as the sender's name for corporate e-mail, the address must be different. Although Outlook typically displays only names, the address is used when sending replies.

When sending messages to networked systems, and when sending notification e-mail messages, Modular Messaging uses the customer's e-mail infrastructure. With Modular Messaging—Exchange and Modular Messaging—Domino, these messages are sent as e-mails from the subscriber's e-mail mailbox. With Modular Messaging—MSS, these messages are sent as standard e-mail SMTP messages from the Modular Messaging system by using the customer's TCP/IP network, but not necessarily using the customer's e-mail servers.

Other networking considerations for Modular Messaging—MSS

Avaya MSS

When using Modular Messaging—MSS systems, there are some additional networking considerations that include:

- The e-mail address for a Modular Messaging subscriber mailbox by default includes the (internal) DNS name of the MSS server.
This name can be replaced with an e-mail domain alias. For example, a default e-mail address of john.smith@mss.internaldomain.company.com can be replaced by john.smith@voicemail.company.com, where voicemail.company.com is an e-mail domain alias. Two or more Modular Messaging—MSS systems cannot currently be configured to share the same e-mail domain alias.
- Two Modular Messaging—MSS systems or a Modular Messaging—MSS and a Message Networking server network using SMTP and LDAP connections over the customer's TCP/IP network. The domain names for the e-mail addresses for the remote subscribers must either be resolvable by DNS or be administered in the hosts file of each system.
- Messages sent external to Modular Messaging—MSS, such as those sent through SMTP/MIME networking or those sent by the Notify Me feature, may be dynamically routed by:
 - Standard SMTP e-mail DNS mail exchanger (MX) lookup, with preference to local hosts file entries
 - Configuring a single outgoing e-mail gateway
- When messages are sent outside the customer's network, for example, Notify Me messages sent to e-mail-accessible paging systems, consideration should be given to:
 - Exposing the internal DNS host name of the MSS server
 - Whether the customer's inbound e-mail gateways allow incoming e-mail (from the Internet) to be delivered into the subscriber's Modular Messaging mailbox

Avaya neither recommends nor discourages allowing Internet e-mail delivery into Modular Messaging mailboxes. However if Internet e-mail can be delivered into a Modular Messaging—MSS system, Avaya strongly recommends that any such e-mail be filtered through the customer's normal spam and virus-checking mechanisms before delivery.

Local mailbox numbers

Subscribers can use local mailbox numbers to address any Modular Messaging subscriber within a voice mail domain. Traditional voice mail systems typically use this form of addressing. From the computer user interface, Modular Messaging—MSS subscribers can address messages to local mailbox numbers in the format `nnnn@domain.com`, where `nnnn` is the mailbox number and `domain.com` is the e-mail domain name used for the e-mail addresses of Modular Messaging mailboxes.

Within a voice mail domain, all local mailbox numbers must have the same number of digits, and each local mailbox number must be unique. Unlike many voice mail systems, Modular Messaging does not require the mailbox number of subscribers to be the same as their telephone extension numbers.

A local mailbox number must have at least 2 digits and can have a maximum of 10 digits.

Note:

Only local subscribers, that is subscribers within a voice mail domain, can use local mailbox numbers for addressing.

Numeric Address

A Numeric Address, also known as a variable length address, enables subscribers to address messages to any local or remote recipient in an organization.

For Modular Messaging—Exchange and Modular Messaging—Domino, the recipient can be anyone in the global directory with a Numeric Address. For Modular Messaging—MSS, the recipient can be any local or remote subscriber in the directory. Remote subscribers that do not have an administered Numeric Address are assigned Numeric Addresses equal to their network addresses. For details, see [Network address](#) on page 178.

Each Modular Messaging subscriber must be assigned a Numeric Address. The Numeric Address allows a subscriber to send a message to any recipient from the TUI without having to know the geographic location of the recipient. The directory makes all Numeric Addresses available to all locations within the organization.

U.S. Organizations might choose to use 10-digit telephone numbers (with the area code) for Numeric Addresses. Other possible schemes include:

- A geographic location code associated with a local mailbox number
- Mailbox numbers

- Employee numbers
- Short Numeric Addresses, for example, 55 for a Help Desk, or 1 for the office of the CEO

A Numeric Address can have a variable length of 1 to 32 digits. All local and remote subscribers can use Numeric Addressing.

With Modular Messaging—Domino, a Numeric Address cannot be the same length as the mailbox number.

With Modular Messaging—MSS and Modular Messaging—Exchange systems, Numeric Addresses can be the same length as mailbox numbers.

Additional forms of addressing from the TUI

In addition to supporting local mailbox numbers and Numeric Addresses, Modular Messaging supports two custom forms of addressing messages from the Modular Messaging TUIs. These forms are needed because the TUIs do not provide a facility to enter alphabetic characters easily. The two forms of addressing are Dial-by-Name and Network address.

When subscribers address messages from the TUIs, the system confirms the correct entry of each recipient's address by playing the name of each recipient. If the subscriber has a recorded name, the recorded name is played. For example, if there are multiple subscribers with the name Jim Smith, subscribers hear Jim Smith speaking his own name. If no recorded name is available, the system uses text-to-speech (TTS) to play the name of the recipient. Modular Messaging—MSS systems support 250,000 names, each of which can have a spoken name.

Dial-by-Name

Dial-by-Name is a method of addressing messages by spelling the name of the recipient using the keys on the telephone keypad.

Note:

With Dial-by-Name, if a remote subscriber's spoken name is not available, the TUI speaks the display name of the subscriber using TTS technology. Consider this when setting up a format for display names.

Administrators can configure the properties of the Dial-by-Name mode of addressing so that when they match names, Dial-by-Name uses either the name or the e-mail address of the recipient. Administrators can configure the properties in the Voice Mail System Configuration (VMSC) tool on the messaging application server (MAS).

Avaya recommends matching by e-mail addresses only if the names of recipients are not easily mapped to a telephone keypad. This mode of addressing (matching by e-mail address) is useful when the name of the recipient includes characters (such as Chinese) that are not part of the Latin character set.

Modular Messaging—MSS

Avaya MSS

Modular Messaging—MSS forces the administration of a US-ASCII name for all subscribers in addition to the display name, which may contain non-ASCII characters. Dial-by-Name, when configured to match the names of recipients, uses this US-ASCII name.

Modular Messaging—Exchange and Modular Messaging—Domino

Microsoft Exchange

IBM Lotus Domino

With Modular Messaging—Exchange and Modular Messaging—Domino, subscribers have only one name. This name may contain non-ASCII characters. European-accented characters are mapped to the unaccented character for Dial-by-Name by using the name of the recipient. Alternatively, Dial-by-Name can be configured to use the e-mail address of the recipient.

All local and remote subscribers can be addressed using Dial-by-Name addressing.

When callers use Dial-by-Name to address messages or to reach an extension or mailbox, callers must enter enough characters to allow the system to reduce the possible matches to be nine or fewer. The system then prompts the caller to select the desired entry. For example, the system plays prompts such as "For John A Smith, press 1. For John B Smith, press 2". If there are more than nine matches, the system will prompt the caller to enter more characters.

For information on configuring Dial-by-Name, see the Modular Messaging, Messaging Application Server administration guides, available on the *Avaya Modular Messaging Documentation* CD-ROM.

Network address

Modular Messaging—MSS subscribers can directly communicate with other Modular Messaging—MSS subscribers or with non-Modular Messaging subscribers through a Message Networking server.

Modular Messaging—MSS subscribers can address messages by using the following address forms in addition to the remote subscriber's Numeric Address:

- Prefix + Remote Number Range set up when administering a remote Modular Messaging—MSS system on a local Modular Messaging—MSS system
 - When multiple Modular Messaging—MSS systems use a Message Networking server as a gateway for LDAP updates, the Remote Number Range is the network address. This network address is the number assigned on the Message Networking server.
 - When a Modular Messaging—MSS system is directly administered as a remote machine on a local Modular Messaging—MSS system, the Remote Number Range is the mailbox number range of the remote system. The mailbox number range is the length of the mailbox numbers on the remote Modular Messaging—MSS system.

- Prefix + Message Networking Network Address when addressing to other systems through a Message Networking server

Message Networking Network Address

The Message Networking server assigns each Modular Messaging subscriber a unique network address that is specific to a voice mail system. A network address is typically a machine prefix followed by the subscriber mailbox number. The machine prefix is common to all subscribers of a particular voice mail system.

A Message Networking server is not assigned a prefix by either the Modular Messaging system or the remote system.

Consider the following example ([Table 20](#)) of a subscriber on a Modular Messaging—MSS system communicating with a networked subscriber, through a Message Networking server.

Table 20: Modular Messaging—MSS and Message Networking server addressing

System	Mailbox number	Network address	E-mail/SMTP address
Modular Messaging—MSS	70000	732-817-0000	name@sys.company.com
Traditional system connected to the Message Networking server	1234	408-555-1234	4085551234@mn.avaya.com

To address a message to a remote subscriber reached through the Message Networking server:

1. The Modular Messaging subscriber uses mailbox number 70000 to log in to the TUI.
2. The subscriber addresses a message to the network address of the recipient on the Message Networking server (408-555-1234).
3. Modular Messaging sends the message via SMTP to 4085551234@mn.avaya.com
4. The Message Networking server converts the e-mail address (4085551234@mn.avaya.com), which contains the network address (408-555-1234) to the mailbox number (1234). The Message Networking server then sends the message to the remote traditional system, through a protocol that the traditional system supports.

To address a message to a Modular Messaging subscriber:

1. The networked subscriber uses mailbox number 1234 to log in to the subscriber mailbox.
2. The subscriber addresses a message to the Modular Messaging recipient, using the network address (732-817-0000) of the recipient.
3. The remote traditional system sends the message to the Message Networking server.
4. The Message Networking server converts the network address (732-817-0000) to the e-mail address of the Modular Messaging subscriber (name@sys.company.com). The Message Networking server then sends the message through SMTP to the Modular Messaging system.

Note:

Modular Messaging subscribers can use the Message Networking e-mail address when addressing from a GUI client. For example, to address a message to a networked subscriber whose network address is 408-555-1234, Modular Messaging subscribers can use 4085551234@mn.avaya.com. The Message Networking e-mail addresses of remote users are in the LDAP directory, so GUI client users can use this directory to resolve names to these e-mail addresses.

Implementing networking without using prefixes

Avaya MSS

An organization with multiple Modular Messaging—MSS systems can implement networking between the systems, without assigning any prefixes.

In this case, the network addresses of the remote subscribers will be the same as their local mailbox numbers. Such an implementation is appropriate for an organization with more subscribers at one location than a single Modular Messaging—MSS system supports, for example, an organization with 40,000 subscribers, all using 5-digit dialing.

With multiple Modular Messaging—MSS systems, some features that are specific to voice mail domains will not work between the systems or will require special administration. For example, features such as call sender of voice mail messages and transfers will not work between the systems. Administrators need to perform some special administration tasks on the Modular Messaging system for these features to work.

When two networked Modular Messaging—MSS systems are located in different cities, their respective prefixes might be a city-specific switch access code. For example, both sites may be using 4-digit dialing within the system, but they could use the switch access code as a prefix when dialing employees at the other site. The network address does not have to match the (assigned) Numeric Address, so in this case the remote users might be addressable in multiple ways.

When Modular Messaging—MSS subscribers use a network address to address messages, Modular Messaging translates the address to an e-mail address, and the message is sent using e-mail protocols.

Additional forms of addressing from the computer user interface

Depending on the GUI client subscribers use to send messages, Modular Messaging supports the following address formats.

Modular Messaging with e-mail servers

Microsoft Exchange

IBM Lotus Domino

When addressing messages from a PC user interface, Modular Messaging—Exchange and Modular Messaging—Domino subscribers can use the respective global directories. An address is unique within the directory. An address entered at any location is automatically available at all locations within the organization. E-mail servers support an enterprise-wide directory, which uses unique identifiers valid from anywhere in the enterprise.

When Modular Messaging—Exchange subscribers use the Client Add-in for Microsoft Outlook application to send messages, they can use the Global Address List for directory assistance.

When Modular Messaging—Domino subscribers integrate Domino Unified Communications (DUC) software from IBM to run with their IBM Lotus Notes Client, they can use the IBM Lotus Notes Address Book for directory assistance.

Additionally, subscribers can address messages by the local mailbox number and Numeric Address of the recipient.

The Global Address List and IBM Lotus Notes Address Book are also available to subscribers using supported standards-based e-mail clients.

Modular Messaging—MSS

Avaya MSS

When using Modular Messaging Web Client, subscribers can address messages to recipients using their names, e-mail addresses, or mailbox numbers. The Web Client provides access to the MSS directory and the e-mail directory. From the directory, subscribers can search for other users and address messages to them. The Web Client supports only Modular Messaging—MSS version.

When Modular Messaging—MSS subscribers use Client Add-in for Microsoft Outlook or a standards-based e-mail client, they can address messages using the LDAP Address Book that the MSS provides. Subscribers can also address messages by name, primary mailbox address, or Message Networking server e-mail address. For information on the Message Networking address, see [Network address](#) on page 178.

Subscribers using Client Add-in for Microsoft Outlook can also address messages to local mailbox numbers and Numeric Addresses of recipients.

Subscribers using any standards-based e-mail client will not be able to use address forms such as local mailbox number and Numeric Address unless the LDAP query string can be modified.

With Modular Messaging—MSS, if a separate e-mail directory exists for corporate e-mails, subscribers must be careful when using directory assistance. Addresses of local subscribers appear in the Modular Messaging directory. If subscribers address a voice message to contacts in the corporate directory by mistake, recipients receive an e-mail message with a .WAV attachment in their corporate e-mail mailboxes.

Note:

When Modular Messaging—MSS subscribers use a standards-based e-mail client to reply to a message, they should ensure that the reply is sent from the sender's Modular Messaging address directly to the MSS rather than from the subscriber's corporate e-mail address. Depending on the client used, this operation may be controlled based on from where the message was retrieved or may require a manual selection when sending the message.

Call Answer responses within networked messaging systems

Avaya MSS

When callers call a Modular Messaging subscriber and the subscriber is not available, the caller can leave a message for the subscriber. Messages left by callers are referred to as Call Answer messages. Modular Messaging—MSS subscribers can respond to Call Answer messages left by local subscribers or by remote subscribers. A local subscriber is a subscriber whose mailbox exists in the same Modular Messaging—MSS system as that of the subscriber.

A remote subscriber is a subscriber whose mailbox exists in any one of the following systems:

- Modular Messaging—MSS connected directly to the called subscriber's Modular Messaging—MSS system
- Any of the following messaging systems that are connected using a Message Networking server to the called subscriber's Modular Messaging—MSS system:
 - Intuity AUDIX
 - Octel Aria
 - Octel Serenade
 - Modular Messaging—MSS
- Messaging systems networked with Voice Profile for Internet Mail (VPIM)
- Messaging systems networked to Intuity Interchange
- Messaging systems connected through one or more additional Messaging Networking servers

Responses to Call Answer messages

In earlier releases, Modular Messaging allowed subscribers to respond to Call Answer messages received from local subscribers only. Subscribers had minimal options to respond to Call Answer messages received from remote subscribers. For example, subscribers were unable to call a remote subscriber who left a Call Answer message for them.

With Modular Messaging—MSS, Release 2 SP3 and later, subscribers can respond to local or remote subscribers. Subscribers can do the following:

- Send a reply message to the Call Answer message.
- Call the subscriber who has left the Call Answer message.
- Generate an e-mail as a response to the Call Answer message if the Notify Me rule is enabled for the subscriber.
- Call the subscriber who left the Call Answer message on a specified phone number if the Call Me rule is enabled for the subscriber.

Administering Modular Messaging systems for Call Answer responses

When a local subscriber leaves a Call Answer message, the messaging system tries to match the calling party number (CPN) to a Private Branch Exchange (PBX) extension of the local subscriber. If the system is successful in matching the CPN to a PBX extension, the system retrieves the name and SMTP address of the called subscriber. This information allows the subscriber who received the Call Answer message to do the following:

- Identify the subscriber who left the message.
- Send a reply message.
- Return a call.

When a remote subscriber leaves a Call Answer message, the messaging system tries to match the CPN with the PBX extension of the remote subscriber. However, as the CPN cannot be directly matched to a remote PBX extension, some additional information other than the PBX extension must be shared between the networked messaging systems.

Modular Messaging allows administrators to create mapping tables that convert the PBX extensions or the network addresses of remote subscribers to telephone numbers. These telephone numbers are then shared between the messaging systems. The messaging systems use the telephone numbers to identify the callers over the network. For example, when a subscriber receives a call from a remote subscriber, the system uses the telephone number to retrieve information regarding the caller.

Administrators can also create dialing rules that specify how outbound calls to the Call Answer messages can be made. The dialing rules specify the dialing string that needs to be prefixed to the telephone number while returning a call to a remote subscriber.

The Call Answer response capabilities are not supported in the following situations:

- If secondary extensions are shared between networked systems
- If the inbound and outbound telephone numbers contain different number of digits
- If multiple telephone numbers, such as internal caller ID and external caller ID, are required to identify a caller
- If the subscriber uses Inband switch integrations (SWINs)
- If a caller has left a Call Answer message through the Call Sender option of the TUIs

Creating mapping tables

When messaging systems are networked through a Message Networking server, administrators must create mappings to create telephone numbers for the remote subscribers.

Note:

If messaging systems are networked through a point-to-point network and the subscribers of the systems can directly dial each other, mappings are not required. Administrators must create only dialing rules in the MAS.

Administrators create mappings in the Modular Messaging—MSS systems and the Messaging Network servers.

The mapping tables have two fields, Map From and Map To. The Map From field contains the starting digits, the left most digit, in a remote subscriber's PBX extension or network address. The Map To field contains the digits that the starting digits must be replaced with to create the canonical phone number.

[Table 21](#) provides a sample mapping table.

Table 21: Mapping table

Map From	Map To
4	719598
47	7195976
31	7195997

For example, if the PBX extension of a remote subscriber is 46175, the starting digit, 4, is replaced with the Map To field value, 719598. The telephone number of the subscriber is 7195986175.

If a subscriber's extension matches more than one mapping, the mapping that matches the longest series of digits is applied. For example, if the PBX extension of a subscriber is 47385, the telephone number of the subscriber is 7195976385.

Administrators can create mappings only with a single set of subscriber information. For example, if a mapping is created by using the PBX extensions of subscribers, all other mappings are also created using the extensions and not using the network address.

Creating dialing rules

System administrators must also create dialing rules, which indicate how the telephone numbers, created by using the mapping tables, can be used to return a call to a remote subscriber. A dialing rule contains the following information:

- Number of digits in the telephone number
- Starting digits of the telephone numbers
- Dialing plan that must be used for dialing the telephone number

[Table 22](#) provides sample dialing rules.

Table 22: Dialing rules

Number of digits	Starting digits	Dialing plan
5	—	Use trunk access code.
10	303538	Use trunk and long-distance access code.

Administrators can set any of the following codes or a combination of the codes as a dialing plan for a dialing rule:

- Trunk access code: Used to dial any number outside the local dialing plan
- Long-distance code: Used to dial a number outside the local area codes
- International access code: Used to dial an international number

Each dialing rule is applied only to telephone numbers that have the specified number of digits and start with the specified starting digits. If a rule applies to a telephone number, the specified dialing plan is used when any subscriber tries to call the number. For example, as in [Table 22](#), the system will use the trunk access code before dialing any 5 digit number.

Administrators can create dialing rules in the MAS. In a Modular Messaging system with more than one MAS, dialing rules need to be set in only one MAS. The dialing rules are automatically shared between the MASs.

For more information about dialing rules, see the Modular Messaging, Messaging Application Server administration guides, available on the *Avaya Modular Messaging Documentation* CD-ROM.

Multiple mailboxes and alias extensions

Modular Messaging enables administrators to configure schemes that support the following:

- Multiple extensions per mailbox
- Multiple mailboxes per extension

Multiple extensions per mailbox

Modular Messaging systems enable a mailbox to have more than one extension number.

A mailbox can have one primary extension number and one or more secondary extension numbers. A secondary extension number is an alternate number that callers can dial to interact with a subscriber.

A secondary extension number provides subscribers with a separate number for direct reception of fax messages and enables callers to use an existing Caller Application. A secondary extension can also be used if each line appearance on the telephone set has a different telephone number. Secondary extensions can be used by individuals who have multiple offices with separate extensions or by small teams where members have their own extensions but need to share a mailbox.

Note:

Secondary extensions can be viewed as alternate numbers for callers to reach a subscriber's mailbox. Thus, all primary extension preferences, such as the preferred TUI language, and rules, such as the Find Me rules, are also applicable to the secondary extension.

With Modular Messaging—MSS Release 1.1, administrators could configure a mailbox to have a maximum of 10 secondary extensions.

With Modular Messaging—MSS Release 2, Modular Messaging—Exchange, and Modular Messaging—Domino, administrators can configure a mailbox to have as many secondary extensions as required. The number of secondary extensions is limited only by the amount of storage space available.

Call Answer support

By default, the Call Answer behavior for the secondary extension numbers is the same as it is for the primary extension. Thus, callers would get to hear the same greetings and prompts, regardless of which extension they dial. The Automated Attendant transfers calls to the primary extension. However, Caller Applications can be used to customize the Call Answer behavior for each extension. For more information, see [Caller Application support](#) on page 187.

When a subscriber with multiple extensions sends a voice message to another subscriber, and if the recipient wants to call the sender, the call will be made to the primary extension of the sender.

As with the primary extension, secondary extension numbers are unique.

Outcall feature support

Secondary extensions do not have an impact on the Call Me server and the Message Waiting Indicator (MWI) server. The MWI server will control only the lamp state for the primary extension. All outcalls are made by using the primary extension.

Caller Application support

With Modular Messaging, each secondary extension number may be associated with a different front-door Caller Application.

If a Caller Application is associated with a called extension and the call is then redirected to the TUI, the Caller Application is executed instead of any default call handling.

If no Caller Application is associated with an extension, TUI uses the default call handling for the mailbox.

Multiple mailboxes per extension

Using Caller Applications, subscribers can achieve coverage for multiple mailboxes from a single number. A single-level Caller Application can transfer the caller to up to nine mailboxes.

Call Answer callers hear "To leave a message for subscriber A, press 1. To leave a message for subscriber B, press 2" and so on. They then hear an announcement from the relevant subscriber's mailbox and can leave a message.

To complete the configuration, administrators must create an association that ties the deployed Caller Application to a specified extension. This is the extension that is dialed to reach multiple mailboxes.

Even when multiple mailboxes are set up for an extension, subscribers are still capable of having their own extension numbers.

Note:

In Modular Messaging—MSS, an Enhanced-List Application (ELA) can be configured so that calls can be made to the extension number of the ELA list, and the message is delivered to all ELA list members.

Networking

The term networking describes how subscribers of a Modular Messaging system can exchange messages with subscribers of other Modular Messaging systems, or, in some cases, with users of other voice mail systems.

Modular Messaging interoperates with other Modular Messaging systems in the following manner:

- Modular Messaging—MSS. Provides native support to SMTP/MIME networking. Using this, subscribers can exchange messages with:
 - Subscribers of other Modular Messaging—MSS systems

Note:

A Modular Messaging Release 3 system can be directly networked only to Modular Messaging Release 1.1 systems with SP6 or later or Modular Messaging Release 2.0 systems with SP1 or later.

- Subscribers of systems connected to an Avaya Message Networking server. The Message Networking server performs the conversion between SMTP/MIME and both proprietary voice mail networking protocols (such as Octel Analog, AUDIX TCP/IP, Aria TCP/IP, and Serenade TCP/IP) and standard protocols (such as AMIS and VPIM).

Note:

With Modular Messaging—MSS, networking is a chargeable option and facilitates networking between a Modular Messaging—MSS system and a Message Networking server. For simplified administration, directory management, and performance, subscribers are advised to consider using a Message Networking server among multiple Modular Messaging—MSS systems. For more information, see [Modular Messaging—MSS and the Message Networking server](#) on page 189.

- Using native networking, Modular Messaging—Exchange subscribers can exchange messages with subscribers of other Modular Messaging—Exchange systems, and Modular Messaging—Domino subscribers can exchange messages with subscribers of other Modular Messaging—Domino systems. Using Octel Analog Networking (OAN), Modular Messaging—Exchange systems can also send messages and receive messages to and from subscribers of the following systems:
 - Unified Messenger—Exchange
 - Octel 250/350 that use OAN
 - Octel 200/300 that use OAN

- Avaya Message Networking server with OAN

Note:

OAN is not supported with Modular Messaging—Domino, Modular Messaging—Exchange for H.323 integrations, nor Modular Messaging—Exchange 2007 systems.

- Modular Messaging—Exchange systems also interoperate with systems connected to an Avaya Message Networking server. However, networking between heterogeneous systems requires careful consideration. Customers and planners are advised to review [Considerations with Message Networking server and Microsoft Exchange](#) on page 447 and should consult the engineering paper Message Networking Implementation Notes. This engineering paper is available on request.

Modular Messaging—MSS and the Message Networking server

Avaya MSS

Planning for the Mailbox ID length, Numeric Address length, and Network Address length is important, when designing a network that involves Modular Messaging—MSS and Message Networking.

When a Modular Messaging—MSS system uses a Message Networking server for communicating with other voice mail systems, certain features are affected.

No partial updates when addressing from the TUI

Modular Messaging—MSS does not support partial updates when addressing to remote subscribers from the TUI. When Modular Messaging subscribers address messages to remote subscribers, from the TUI, recipients must be pre-administered on the Modular Messaging—MSS as remote subscribers. All remote subscribers in the network must be added through an automatic networking directory update or manually pre-administered on the Modular Messaging—MSS system to be able to receive messages addressed from the Modular Messaging TUI.

Reply-all

Messages coming through a Message Networking server do not contain a complete list of recipients because the Message Networking server cannot be sure that it received a complete list of recipients from the originating node. When using reply-all to messages coming through a Message Networking server, the reply-all feature sends the reply only to the originator of the message.

Message Networking server among multiple Modular Messaging—MSS systems

Avaya MSS

Modular Messaging—MSS systems can establish direct connectivity with each other by using SMTP/MIME networking. However, for simplified administration, directory management, and performance, customers are advised to consider using a Message Networking server among multiple Modular Messaging—MSS systems.

Message Networking server for administration: Modular Messaging requires each remote machine to be administered on the Modular Messaging system.

With the implementation of a Message Networking server, remote machines are administered on the Message Networking server. Each Modular Messaging system needs to administer only the Message Networking server system, rather than each remote machine, thus simplifying administration.

Message Networking server for performance: Large directory updates between Modular Messaging systems can significantly impact system performance.

A Message Networking server eliminates the possibility of multiple directory updates occurring at the same time, thus improving the performance of directory updates.

When the number of subscribers of a Modular Messaging system is large, customers are advised to consider using the high-availability configuration of the MSS (MSS-H). MSS-H improves performance of directory updates by providing higher throughput than the standard-availability MSS configuration (MSS-S).

[Table 23](#) defines when a Message Networking server is recommended and when it is optional in an environment that contains multiple Modular Messaging—MSS systems.

Table 23: Message Networking Server in a multiple Modular Messaging—MSS environment

Average number of subscribers per Modular Messaging—MSS system	3 to 5 Modular Messaging—MSS systems	6 to 10 Modular Messaging—MSS systems	More than 10 Modular Messaging—MSS systems
Less than 200	Optional	Optional	Recommended for administration
200 to 2,000	Optional	Optional	Recommended for administration and performance
2,000 to 5,000	Optional	Recommended for performance	Recommended for administration and performance

Table 23: Message Networking Server in a multiple Modular Messaging—MSS environment (continued)

Average number of subscribers per Modular Messaging—MSS system	3 to 5 Modular Messaging—MSS systems	6 to 10 Modular Messaging—MSS systems	More than 10 Modular Messaging—MSS systems
5,000 to 10,000 Customers are advised to use MSS—H.	Recommended for performance	Recommended for performance	Strongly recommended for administration and performance
More than 10,000 Customers are strongly advised to use MSS—H.	Strongly recommended for performance	Strongly recommended for performance	Strongly recommended for administration and performance

Chapter 7: Modular Messaging and fax servers

Modular Messaging—Avaya Message Storage Server (MSS) is a fax-capable messaging solution that includes native fax resources to provide fax capability.

Modular Messaging—Microsoft Exchange version and Modular Messaging—IBM Lotus Domino version require a third-party fax server for fax messaging.

Note:

Avaya does not sell, service, or maintain third-party fax server hardware or software. Customers that currently do not have a fax solution can purchase a third-party fax solution from a choice of fax vendors and their authorized distribution channels, some of which are also authorized for the Avaya Modular Messaging solution.

This chapter provides information on the fax server setup with all versions of Modular Messaging. This chapter contains the following topics:

- [Modular Messaging—MSS native fax server](#) on page 194
- [Providing interoperability with third-party fax servers](#) on page 197
- [Working with fax messages](#) on page 201

Modular Messaging—MSS native fax server

Avaya MSS

Modular Messaging—MSS uses a native fax server to support the following fax features:

- Subscribers can receive, review, send, and print fax messages. When sending faxes, the feature attaches a cover page to the fax message.
- Subscribers can forward a copy of their inbox listing to a fax device through the Modular Messaging Aria telephone user interface (TUI).
- Subscribers can forward a fax message with a voice annotation.
- Fax senders can leave fax-only messages or voice-and-fax messages for subscribers.
- Subscribers using Modular Messaging Outlook Client and Modular Messaging Restricted Outlook Client can print multilingual text messages to a fax device, by addressing the text messages to MM:fax=nnnn@host.domain, where nnnn is the number of the destination fax machine or the recipient. Similarly, when subscribers use a standards-based e-mail client to address fax messages, they must ensure that the message is sent directly to the MSS, using their Modular Messaging identity.
- Subscribers can print text messages received in the Modular Messaging mailbox.

Incoming faxes

Receipt of incoming faxes can take place in several ways, depending on how the system is set up with Direct Inward Dialing (DID):

- On systems with DID, callers call into a subscriber mailbox and press Start on the fax device.
- On systems without DID, callers call the Automated Attendant from the fax machine, select the extension of the subscriber either by using Dial-by-Name or by entering the extension of the subscriber, and press Start on the fax device.

The native fax server provides fax messaging capabilities through the voice ports on a messaging application server (MAS). An MAS receives fax messages using the drivers provided by Dialogic. When an MAS receives a call, the TUI calls the relevant function, and the fax data is acquired and stored in the message.

An administrator can control the incoming fax messages of subscribers using the Class-of-Service (COS) settings.

Outgoing faxes

Outgoing fax messages include fax messages that subscribers:

- Create and manually address to fax=nnnn@host.domain, where nnnn is the number of the destination fax device or the recipient.
- Print to a fax device from the TUI. An MAS takes responsibility of the fax message and sends it to the MSS.

An administrator can control the outgoing fax messages of subscribers using the Class-of-Service (COS) settings.

Fax Sender Service

On receiving a fax message, the Fax Sender Service converts the text message to Tag Image File Format (TIFF)/F Profile for Facsimile Dialogic format, adds a cover page, includes any TIFF/F file that the subscriber may have attached, places an outgoing call to the fax device, sends the fax, and sends a message to the subscriber indicating whether the fax was successfully transmitted.

If the fax is not delivered in spite of the maximum number of retries, the fax is deemed undeliverable, the message is deleted from the fax mailbox, and a non-delivery-report is sent to the subscriber who sent the message.

Modular Messaging enables administrators to configure fax properties, including defining company identification that appears on the outgoing fax cover pages.

The Fax Sender Service can be installed on every MAS in a voice mail domain. However, only one MAS can be designated as the active fax sender for the voice mail domain. The Fax Sender Service installed on this MAS requests and utilizes fax resources available on any of the MAS units in the voice mail domain to receive or transmit fax messages. The maximum number of concurrent incoming or outgoing faxes that a system supports is equal to the sum of the fax resources on all the MAS units in the voice mail domain.

[Table 24](#) contains the maximum number of fax resources that different port boards support. Fax resources are shared among all voice ports on this board.

Table 24: Maximum fax resources on a port board

Port board	Number of fax resources
T1 port board	4 (Dual-span card)
E1 port board	4 (Dual-span card)
8-port DSE port board	2
12-port analog port board	4
4-port analog port board	4

Some considerations that are applicable to Fax Sender Service include:

- Avaya-provided T1 and E1 cards are dual span. The second span is used for fax resources and is not available for voice calls.
- H.323 integration currently does not support fax messaging.
- In an Avaya MAS S3400 server, four card slots are available for port cards. However, due to CPU and other resource constraints, a single MAS may not be able to support four port cards for the various card types.
- In an Avaya MAS S3500 server, two card slots are available for port cards.
- The Windows 2003 Fax Service has no connection with Modular Messaging. Starting or stopping this service has no effect on the fax capabilities of Modular Messaging.

Providing interoperability with third-party fax servers

Microsoft Exchange

IBM Lotus Domino

Modular Messaging—Exchange version and Modular Messaging—Domino version require a third-party fax server for fax messaging.

This section describes how third-party fax servers interoperate with Modular Messaging.

Note:

The customer provides the hardware and software required for the third-party fax server. For information on the fax server hardware and software recommended for a particular switch integration type, see the configuration (SWIN) notes available at <http://www.avaya.com/support>. These configuration notes also provide information on where the fax server can be installed.

Overview of third-party fax servers

Modular Messaging, in conjunction with a compatible, customer-provided, third-party fax server, offers the following fax features:

- A subscriber mailbox can receive and store fax messages.
- Subscribers can forward fax messages and e-mail messages to fax devices for printing.
- Subscribers can forward a copy of their inbox listing to a fax device through the TUI.
- Subscribers can forward a fax message with a voice annotation.
- Fax senders can leave fax-only messages for subscribers.
- Subscribers can print e-mail messages that have attachments (for example, a document in Microsoft Word or Microsoft Excel format) to a fax device. The fax server converts such attachments to fax format. The types of attachments that can be printed to a fax device depend on the capabilities of the fax server.

Incoming faxes

Receipt of incoming faxes can take place in several ways, depending on how the system is set up with Direct Inward Dialing (DID):

- On systems with DID, callers call into a subscriber mailbox and press Start on the fax device.
- On systems without DID, callers call the Automated Attendant from the fax machine, select the extension of the subscriber either by using Dial-by-Name or by entering the extension of the subscriber, and press Start on the fax device.

When an MAS receives a call and detects the fax tone, it transfers the call to the third-party fax server. When the fax server answers the call, the MAS plays the fax routing information inband to the fax server. Based on the fax routing information, the fax server then delivers the fax message to the mailbox of the recipient.

Note:

The fax server must support dual-tone multifrequency (DTMF) routing.

Requirements for third-party fax server interoperability with Modular Messaging

Avaya recommends that the third-party fax server reside on a separate server. The fax hardware is connected to a fax hunt group on the switch.

The following are the requirements for third-party fax server interoperability with Modular Messaging:

- The fax server must be integrated with the mail system as an e-mail connector or an e-mail gateway for fax.
- The fax server must use addressing that is specific to Modular Messaging:
 - With Microsoft Exchange, use a fax addressing type specific to Modular Messaging.
 - With IBM Lotus Domino, use a specified foreign domain name for the right-hand part of an address. For example, nnnnn@FAX, where FAX is the foreign domain name.

This addressing is necessary to deliver messages to the fax server for transmission and to create one-off or ad-hoc addresses.

- The fax server must support DTMF detection and collection.
- The fax server must match the DTMF fax routing number supplied by Modular Messaging with the fax routing address of a subscriber.
- The fax server must create faxes as e-mail messages with TIFF/F attachments and send them to the intended recipient.
- Depending on the messaging environment, the fax messages placed in the inbox of a subscriber should be identified by one of the following:
 - A unique message class (IPM.NOTE.FAX) so that they can be detected as faxes by Modular Messaging—Exchange version.
 - A unique message type (FAX) so that they can be detected as faxes by Modular Messaging—Domino version.

Note:

If a fax server does not support the message class or message type, Modular Messaging does not classify messages as faxes. Instead, depending on the fax server, the message is classified as a normal e-mail message with TIFF/F attachments.

Enabling fax for subscribers

Subscribers with fax-enabled mailboxes can use the TUI to gain access to fax messages in their mailbox. From the TUI, fax-enabled subscribers can route fax or e-mail messages (with or without attachments) to any fax device for printing. Subscribers can also listen to the number of fax messages, review fax messages in a separate queue, print contents of the mailbox, and forward fax messages with voice annotations.

Modular Messaging—Exchange version

Microsoft Exchange

Subscribers are fax-enabled when a system administrator adds a fax routing address (FAXROUTE:) as an e-mail address type for the subscriber. The contents of the fax are passed to the fax server with the inbound call.

When a subscriber requests the printing of a fax or e-mail message, Modular Messaging requests that Microsoft Exchange forward a copy of the message to the default fax destination or to a one-off address of the form FAX:nnnnnnn, where FAX is the address type for the fax server and nnnnnnn is the telephone number of the fax device.

Modular Messaging—Domino version

IBM Lotus Domino

Subscribers are fax-enabled when a system administrator adds a fax routing address as an e-mail address type for the subscriber. The contents of the fax are passed to the fax server with the inbound call.

When a subscriber requests the printing of a fax or e-mail message, Modular Messaging requests that IBM Lotus Domino forward a copy of the message to the default fax destination or to a one-off address of the form nnnnnnn@FAX, where FAX is the address type for the fax server and nnnnnnn is the telephone number of the fax device.

Routing inbound fax calls to the third-party fax server

Microsoft Exchange

IBM Lotus Domino

Like voice calls, fax calls placed to the extension of a subscriber are redirected to the MAS when these calls encounter a ring-no-answer or busy condition. Whenever the MAS receives a call and detects that it is a fax, it places the call on hold and initiates a call transfer to the fax server hunt group.

After a fixed time delay (5-second default), Modular Messaging sends fax routing information as DTMF codes to the fax server and then transfers the fax call. The fax routing information that Modular Messaging sends is determined by retrieving the fax routing address for the subscriber, based on the called extension number or entered mailbox number.

After the fax server receives the fax, it completes the following steps:

1. Determines the address of a subscriber by finding the subscriber with a matching fax routing address
2. Creates an e-mail message with a TIFF/F attachment (TIFF group 3 fax format)
3. Does one of the following:
 - In Microsoft Exchange, sets the message class to IPM.NOTE.FAX
 - In IBM Lotus Domino, sets the message type to FAX
4. Sends the message to the subscriber mailbox

Note:

If the subscriber has Call Me enabled for fax messages, Modular Messaging makes an outcall to the subscriber and provides a notification of the new fax message.

Working with fax messages

This section contains information about the fax messaging capabilities Modular Messaging supports, from the TUI and from the computer user interfaces.

Note:

H.323 integration currently does not support fax messaging.

Fax messaging from the TUI

The Modular Messaging TUI provides the following fax capabilities to subscribers and callers:

- Callers can leave fax messages for subscribers.
- Subscribers can review fax messages.
- Subscribers can respond to fax messages.
- Subscribers can print fax messages to a default fax destination or to a new fax destination.
- Subscribers can configure a fax destination.
- Subscribers can create a voice-and-fax message using the Modular Messaging AUDIX TUI. However, this capability is depended on the SWIN type.

Note:

Modular Messaging—Exchange and Modular Messaging—Domino provide these capabilities in conjunction with a third-party fax server. Some features depend on the specific fax server and may not be available.

Fax Call Answer

The TUI enables callers calling from a fax machine to leave fax messages for subscribers. A Modular Messaging—MSS system also supports voice-and-fax Call Answer messages.

Modular Messaging—MSS subscribers can have secondary fax extensions associated with their mailboxes. This enables subscribers to give callers a fax number that is different from the primary extension number.

Modular Messaging—Exchange and Modular Messaging—Domino subscribers can also have a separate number for fax; in this case, incoming fax calls are sent directly to the third-party fax server.

Call Answer fax mailbox features

Modular Messaging—MSS enables customers to configure single or dual DID fax delivery mechanisms, by using the multiple extensions per mailbox feature. For more information, see [Multiple extensions per mailbox](#) on page 186.

Single extension per mailbox (single DID fax delivery): This method uses a single number to reach a subscriber mailbox for both voice and fax calls. The call comes through the switch and is forwarded to the subscriber mailbox on conditions such as:

- The extension is busy.
- The extension rings, but there is no answer.
- The system has been configured to forward all calls.

However, if the subscriber answers the call before it is forwarded to the mailbox, the subscriber must manually transfer the call back to the mailbox on the server to receive the fax.

Multiple extensions per mailbox (dual DID fax delivery): This method uses two different numbers to reach a subscriber mailbox—one for voice messages, the other for fax or voice-and-fax messages. Both calls come through the switch and are integrated into a single mailbox. This method requires no intervention by the fax recipient.

Note:

Only the Modular Messaging—MSS version supports voice-and-fax Call Answer messages.

Fax Call Answer with Modular Messaging—MSS

The MAS receives the fax and delivers it to the MSS.

Fax Call Answer with Modular Messaging—Exchange and Modular Messaging—Domino

The MAS detects the fax tone, identifies the mailbox information, and transfers the call to a customer-provided third-party fax server along with the necessary mailbox information. The third-party fax server then receives the fax and puts it into the mailbox.

Creating fax messages

Subscribers cannot use the TUI to create new fax messages. To create a fax message from the TUI, subscribers must use the Call Answer feature to send a fax message to their own mailboxes. Subscribers can then log in to their respective mailboxes and forward the message to the intended recipients. The recipients can be local or remote networked subscribers.

Note:

Depending on the SWIN type, a subscriber can create a voice-and-fax message using the Modular Messaging AUDIX TUI.

With Modular Messaging—MSS, subscribers can leave voice-and-fax messages during Call Answer. These messages are treated as fax messages.

Reviewing fax messages

When subscribers log in to their mailboxes from the Modular Messaging TUI, they are informed of how many new messages they have, including new fax messages. When subscribers choose to review fax messages, the system plays the message header information. Header information includes the types of message (fax), the name or number of the sender, if available, the date and time of receipt of the messages, and the number of pages the fax contains.

Subscribers can use the TUI options to respond to a fax message in much the same way as they can to voice or e-mail messages.

Subscribers can do the following:

- Forward a message with or without a voice annotation.
- Reply to the sender of the messages, provided that the fax originates from a Private Branch Exchange (PBX) extension that is the primary or a secondary extension of a subscriber in the same voice mail domain.
- Call the sender of the message, provided that the caller is within the dialing plan of the voice mail domain.
- Print the fax message to a fax device.

Printing fax messages

Subscribers can print fax messages to a fax device before or after reviewing them. When printing fax messages, subscribers can print to the default fax destination or they can provide a new, alternate fax destination. Subscribers configure the default destination for the mailbox by using the TUI options, the Web Subscriber Options component, and the Subscriber Options component.

When calling from a fax machine, Modular Messaging—MSS subscribers can print the current fax message in the same call, thus terminating the subscriber log-in session.

Subscribers can use any one of the following formats to enter the fax destination number:

- Simple number format. This format includes the complete telephone number of the fax device including the trunk access and area codes or city codes, as a single string of digits; for example, 902088674100, where 9 is the trunk access code, 020 is the area access code, and 88674100 is the fax number.

PBX account or authorization codes may be added to the fax dialing string where appropriate. This entire digit string is sent to the PBX. Modular Messaging—MSS attaches a cover page to the fax, and this cover page includes the entire digit string, thus making the account or authorization code visible to the fax recipient.

Note:

Authorization codes for fax addressing are only supported with analog and some Digital Set Emulation (DSE) switch integrations. Authorization codes are not supported in the following switch integrations: T1/E1, QSIG, SIP, and H.323.

- Canonical format. This format specifies the full fax telephone number for the voice mail domain for use by the TUI. When a subscriber wants to send a fax, the system will prompt for these outgoing numbers or allow alternative entries as an aid to addressing. The canonical address includes the country code and area code or city code:

+CountryCode (AreaCode or CityCode) SubscriberNumber

For example:

+1 (408) 3458000

If a Modular Messaging—MSS system is configured to use canonical addressing, access codes for the fax address must be configured. Subscribers can use canonical addressing if the fax servers support canonical addressing and if canonical addressing has been enabled by using the Voice Mail System Configuration (VMSC) tool. The canonical address also allows the system to prevent unnecessary toll calls if the receiver of the fax uses the same country code or area code or city code as the sender.

If subscribers use dialing prefixes, such as 9 or 1, these prefixes must be included in the address format.

When subscribers print a fax message, Modular Messaging—MSS adds a cover page to the fax. The details of the cover page are added when administering the MAS.

Note:

Modular Messaging—MSS subscribers can also print text messages or messages with TIFF/F attachments to fax devices.

Note:

Modular Messaging—Exchange and Modular Messaging—Domino subscribers can print text and corporate e-mail messages, messages with TIFF/F attachments, and Microsoft Office file attachments (including Word documents, Powerpoint presentations, and so on) to a fax device. In addition, subscribers can print any specific attachments that are supported by the third-party fax server.

Fax messaging from the computer user interfaces

Computer user interfaces treat fax messages like e-mail messages. From a PC user interface, subscribers can:

- Print faxes received into their mailbox to a fax machine or to a local or networked-attached printer
- Print text messages received into their mailbox to a fax machine

Note:

When Modular Messaging—MSS subscribers use a standards-based e-mail client to print text messages to a fax device, they must address the messages to fax=nnnnn@address.

In conjunction with a third-party fax server, subscribers of Modular Messaging—Exchange or Modular Messaging—Domino can also print corporate e-mail messages to a fax machine.

Modular Messaging—MSS

Avaya MSS

Modular Messaging—MSS subscribers can view and forward fax messages from Modular Messaging Web Client. Modular Messaging Web Client does not support creating fax messages. However, subscribers can send fax messages in one of the following ways:

- Depending on the system configuration, subscribers may be able to send a fax from a fax device to their Modular Messaging mailbox. Once the fax is in the mailbox, subscribers can forward the message with the fax attachment.
- Subscribers can create a .tif file with fax software or a graphics program and scanner and then attach the .tif file to a message.

Modular Messaging—MSS subscribers can create and send fax messages from a standards-based e-mail client. Subscribers can create a fax message using Windows 2003 features and send it to the intended recipient's fax device, by using the address format `fax=nnnn@host.domain`, where `nnnn` is the number of the destination fax machine or the recipient. The use of this form of address is restricted to SMTP sessions originating from authenticated (local) subscribers.

When the MSS receives a message with such an address format, it delivers it to the fax mailbox. The Fax Sender Service converts the text message to a TIFF/F format, adds a cover page, includes TIFF/F files (if any) that the subscriber attached to the message, and notifies the MAS of the fax message. The MAS places an outgoing call to the destination number and sends the TIFF/F data to the remote fax device.

Modular Messaging notifies subscribers of the delivery status by sending a fax delivery status notification message to the mailbox of the subscriber.

Some considerations that are associated with fax messaging from the computer user interfaces of Modular Messaging—MSS are:

- The Fax Sender Service can transmit only image files that conform to the TIFF/F format. TIFF/F is F Profile of TIFF for Facsimile. An arbitrary TIFF file that does not meet all the requirements for TIFF/F is not guaranteed to be acceptable for transmission as a fax.
- When subscribers send fax messages or print text messages to a fax device by using Modular Messaging Outlook Client or Modular Messaging Restricted Outlook Client, they address messages to `fax=nnnn@host.domain`. Subscribers must resolve the address (press CTRL+K) and specify that the custom e-mail type is MM, to ensure that the message is sent through Modular Messaging. Alternatively, subscribers can address messages to `MM:fax=nnnn@host.domain`.

Modular Messaging and fax servers

For more information, see *Avaya Modular Messaging Microsoft Outlook Client User Guide* or *Avaya Modular Messaging Microsoft Restricted Outlook Client User Guide*.

Similarly, when subscribers use a standards-based e-mail client to address fax messages, they must ensure that the message is sent directly to the MSS, by using their Modular Messaging identity.

Modular Messaging—Exchange

Microsoft Exchange

With Modular Messaging—Exchange, subscribers using the Modular Messaging Outlook Client application can forward fax messages addressed to [fax:name@phonenumber], where name is the subscriber's name and phonenumber is the extension. For example:

[fax:Jane Doe@7771234] would forward fax messages to Jane Doe whose extension is 7771234.

Chapter 8: Telephony concepts

This chapter describes how Avaya Modular Messaging communicates with various telephony environments to provide call-processing features.

This chapter includes the following topics:

- [Voice ports](#) on page 208
- [Switch integration and telephony protocols](#) on page 209
- [Switch integration features](#) on page 214
- [Signaling](#) on page 218
- [Hunt groups](#) on page 219

For switch integration (SWIN) documentation, see the configuration notes available from an Modular Messaging support representative or from the Avaya Support Center at <http://www.avaya.com/support>.

Configuration notes provide integration information for several types of switch and fax devices. Configuration notes provide information on the common features of SWINs, the procedures for configuring switch integration, and the considerations for each type of integration. Configuration notes are updated frequently to reflect best practices and current knowledge. Avaya advises customers to verify that they are referring to the latest version of a configuration note.

Voice ports

Messaging application server (MAS) units provide a critical link between the telephone call switching equipment and the message store. MAS units communicate with the switch by means of several telephone endpoints known as voice ports. Voice ports receive inbound calls and place outbound calls in the same way as any other extension on the switch.

Modular Messaging supports a range of voice cards, offering various port densities. The Avaya MAS S3400 server offers four card slots for port cards. However, because of CPU and other resource constraints, an MAS S3400 server may not be able to support four port cards for the various card types. The Avaya MAS S3500 server offers two card slots for port cards. Customer-provided hardware may have a different number of card slots for port cards.

Note:

H.323 and Session Initiation Protocol (SIP) do not use voice ports. All further references to voice ports are equivalent to voice channels for H.323 and SIP.

Voice ports or channels can be configured into port groups that are associated with Modular Messaging components, for example:

- Telephone user interface (TUI)
- Desktop client
- Call Me Server
- Message Waiting Indicator (MWI)
- Fax

Voice cards provide telephony signaling to the Modular Messaging software. The way in which this signaling is implemented depends on the telephony protocol. For example, with inband analog telephony, the signaling is implemented in the voice path. With other types of telephony protocol, for example, Q.Signaling (QSIG), a separate signaling channel is used.

Switch integration and telephony protocols

Switch integration is the means by which the switch and the Modular Messaging system exchange control information relevant to calls, MWI status, and so on. This control information may be passed inband, along with the voice data, or out-of-band, separate from the voice data.

Switch integration is achieved when a call is presented to a voice port and information about the call is supplied to the MAS software. This information includes the nature of the call (for example, a direct call or a call deflected on busy detection), called party information (for example, the number of the busy extension for a deflected call), and the calling party number, if known. Switch integration includes MWI status information, where MWI activity pertains to messages, not calls. An MWI request can be sent as the result of a message arriving from some remote system, without any telephone calls on the local system.

Modular Messaging supports the following telephony protocols and switch integrations for connecting the MAS to the switch:

- IP integration
 - SIP
 - H.323
- QSIG D Channel
 - T1 QSIG: T1 digital trunks with QSIG signaling
 - E1 QSIG: E1 digital trunks with QSIG signaling
- Digital Set Emulation
- Analog telephony interface
 - RS-232 serial integration
 - Inband Dual-Tone Multifrequency (DTMF) integration

For more information on voice card options and the port boards that Modular Messaging supports, see *Modular Messaging Release 3 Installation*.

Session Initiation Protocol

Modular Messaging Release 3 and later supports SIP as a SWIN type. SIP is an important technology for establishing real-time audio and multimedia calls in a converged IP network environment.

Modular Messaging provides SIP with Avaya Communication Manager Release 3.1.

With SIP, the switch and the MAS are connected to the local area network (LAN). All exchange of information, such as call information, signaling information, and voice data, happens by means of voice channels through the LAN.

In Modular Messaging Release 3 and later, each MAS supports a maximum of 48 voice channels with the S3500 server. Similarly, each MAS supports a maximum of 20 voice channels with the S3400 server. The number of voice channels supported on customer-provided hardware depends on the processing resources of the hardware.

SIP connectivity between the MAS and Avaya Communication Manager is accomplished by means of an Avaya SIP Enabled Services (SES) proxy. The Modular Messaging system is connected to the switch, using the SES proxy, through SIP trunks. The SIP trunks are administered as part of a trunk group on the switch.

The SIP integration transmits signaling information and MWI information by using SIP packets. Signaling information is encrypted before transmission. However, media information for SIP connectivity is not encrypted.

H.323

H.323 is a call signaling protocol that relies on packet-based networks, such as an IP network, for transmission of voice.

Modular Messaging provides H.323 with Avaya Communication Manager (Release 1.1 or later) and Avaya DEFINITY (Release 10 or later).

With H.323, the switch and the MAS are connected to the LAN. All exchange of information, such as call information, signaling information, and voice data, happens by means of voice channels through the LAN.

In Modular Messaging Release 3 and later, each MAS supports a maximum of 20 voice channels with the S3400 server. Similarly, each MAS supports a maximum of 30 voice channels with the S3500 server. The number of voice channels supported on customer-provided hardware depends on the processing resources of the hardware.

H.323 connectivity between the MAS and Avaya Communication Manager is accomplished by means of H.323 trunk groups configured as tie trunks supporting QSIG features. QSIG is a standards-based, private networking protocol, based on Q.931 standards (ISDN). Signaling information and MWI information are transmitted using QSIG messages embedded in an H.323 packet.

Note:

H.323 currently does not support fax capabilities, Teletypewriter (TTY), and Octel Analog Networking (OAN).

QSIG D Channel

ISDN protocols, such as QSIG, carry signaling information in the D channel for calls in which voice data is carried in separate but associated bearer channels. This method of using the D channel and the bearer channels is known as Common Channel Signaling (CCS). The data in this channel can be used for integration.

For QSIG integration, Modular Messaging supports 23-port T1 port boards and 30-port E1 port boards.

The Avaya switches that Modular Messaging supports with T1 and E1 QSIG integration are Avaya Communication Manager (Release 1.1 or later) and Avaya DEFINITY (Release 10 or later). In Modular Messaging Release 3 and later, Modular Messaging also supports Cisco Call Manager and Siemens switches with the T1 integration.

T1 digital trunks

A T1 connection is a digital transmission link with a capacity of 1.544 megabytes per second (MBps). T1 trunks carry 24 concurrent telephone connections multiplexed into time slots. Each time slot carries sound digitized at 64 kilobytes per second (KBps), which can be used to convey voice or signaling information.

T1 is a standard for digital transmission in North America, widely used by telecommunications service providers to connect to remote locations and to connect switches to public networks. T1 digital trunks can connect MAS units to the switch. This capability enables the use of simplified wiring, with one wire for 24 time slots: 23 bearer channels (voice) and 1 signaling channel (data).

Customers that use T1 between their switch and service provider have the option of using E1 between the switch and the MAS to obtain higher port density per card. Usually though, customers choose to use T1 to match the interface used for external and internal communication and establish a consistent model for switch provisioning.

E1 digital trunks

Outside North America, the standard for primary rate connections is an E1 digital trunk, which is a digital transmission link with a capacity of 2.048 MBps. This link is divided into 32 time slots: 30 bearer channels (voice), 1 signaling channel (data), and 1 framing channel. Each time slot carries 64 KBps of data.

Digital Set Emulation

Digital Set Emulation (DSE) is a digital protocol developed by switch manufacturers to connect digital telephones to their switches. Using DSE, Modular Messaging can emulate digital telephone sets. These telephone sets can provide all the features that a voice mail system requires to integrate with a switch. For example, they can support the receipt of calling and called party identity and can have MWIs and programmable keys.

Many switch vendors use proprietary digital protocols to connect their own hand sets to the switch. These protocols provide call control and integration information. The DSE integrations that are supported in Modular Messaging are listed in the Configuration Notes Master Index for Modular Messaging on the Avaya Support Web site at <http://www.avaya.com/support>.

Note:

In general, Avaya recommends DSE integration for Modular Messaging systems only if the system contains 500 or fewer mailboxes.

Analog telephony interface

With analog signaling, sound is represented by varying current rather than digital signals. Telephony signaling, such as on-hook or off-hook, is conveyed by completing and disconnecting the circuit. The MAS dials outbound calls by using DTMF tones. All other call progress states, such as dialtone, ring-back, and busy, are conveyed through standard tones.

To initiate a three-way call, Modular Messaging issues a flash-hook (also known as a switch hook flash). On receipt of the flash-hook, the switch usually gives a second dialtone, allowing Modular Messaging to place an enquiry call. The MAS can then dial another number and transfer the call (by hanging up). Depending on the switch type, the switch reconnects Modular Messaging to the caller if the inquiry call clears or fails.

Analog with DTMF call-progress signaling

Using standard tones, such as ring-back and busy, to convey call progress can be imprecise and slow. For example, when an MAS dials an outbound call and detects when the call is answered, it must go to off-hook, wait for a dialtone, and then dial the number. At this point, it detects one of the following standard tones: ring-back, busy, speech, or silence. Some time is required to detect the standard tone, particularly if detection is inferred by the absence of other tones. However, when using DTMF tones, the MAS can quickly and accurately detect call progress.

Inband DTMF integration

With inband integration, the switch sends DTMF tone strings to the MAS port when the call is first placed to the port. These DTMF tone strings are sent within the voice channel and not on a

separate data channel, thus the name inband integration. MAS units are configured to recognize the format of these tone strings and interpret the information.

RS-232 serial integration

With RS-232 serial integration, a separate RS-232 serial communications interface is used to send control information between the switch and the MAS. Modular Messaging supports several RS-232 serial integration protocols to send data to the MAS. The most widely used protocol is the standard Simplified Message Desk Interface (SMDI) protocol. In other cases, the RS-232 interface is proprietary to a particular switch.

Note:

Some switches can support only a single serial interface for one hunt group. MAS units, when used in a multiserver voice mail domain, can operate with a single serial interface. This is known as remote integration.

Switch integration features

Configuration notes provide integration information for several types of switches. These configuration notes also provide information on the integration features that a particular switch integration supports.

Integration features include:

- **System Forward to Personal Greeting:** The switch controls the call transfer conditions when the following conditions occur:
 - **All Calls:** All calls are transferred directly to the voice messaging system, regardless of the status of the subscriber extension. This feature can be configured on the switch.
 - **Ring/No Answer:** The subscriber extension rings, but no one answers the call. The switch transfers the call to the voice messaging system after a certain number of rings. The number of rings is four by default but can be configured on the switch.
 - **Busy:** The subscriber extension is busy. The switch transfers the call to the voice messaging system on detecting the busy signal.
 - **Busy/No Answer:** Certain switches have multiple appearances of the same telephone number on a single telephone set. Each appearance of the number can function as a separate line, meaning that each appearance can carry a separate conversation. With such switches, Busy/No Answer features mean that the switch transfers the call to the voice messaging system on detecting a busy signal. The telephone rings on the second or third line appearance, but, because the switch detected a busy signal during the first line appearance, the call is treated as busy.
- **Station Forward to Personal Greeting:** The subscriber controls the call transfer conditions when the following conditions occur:
 - All Calls
 - Ring/No Answer
 - Busy
 - Busy/No Answer

These features work in a manner similar to the way the switch controls the forwarding conditions, except that these features can be configured by subscribers on their telephone sets.

- **Automated Attendant:** This is an optional feature provided by Modular Messaging, which allows initial call handling.

Note:

In a QSIG integration, if the called subscriber is not reachable, callers are once again presented with the Automated Attendant. The Automated Attendant then guides callers through the process of leaving messages for subscribers.

- **Direct Call:** Permits automatic login. When subscribers dial the hunt group, they need to enter only their password for mailbox access.
- **External Call ID (ANI):** The switches pass on the identification of external callers to the Modular Messaging system.
- **Internal Call ID:** The switches pass on the identification of internal callers to the Modular Messaging system.
- **MWI:** The ability of the switch to support MWI, by controlling the light (on/off) and stutter dial tone on telephone sets.
- **Multiple Call Forward:** Multiple Call Forward or Double Call Forward supports transferring calls to two or more recipients, while providing the system greeting of the original recipient. This feature works only when all extensions have coverage to voice mail. For example, if A calls B and the call is automatically diverted to C, and if C does not answer the call, the call is transferred to the voice mail system. The integration retains the Call ID of B, the original target of the call and plays the target that B has activated. The benefit of this feature is that a call may be transferred more than once without losing the original Call ID (as long as the call continues to forward to voice mail), and callers would still hear the greeting of the original target.
- **Multiple Greetings:** Enables subscribers to have multiple greetings, depending on the call condition. For example, subscribers can activate a greeting for a time when the extension is busy, and another greeting for a time when there is no response. This feature can be used only when supported by the switch.
- **Outcalling:** The ability of the switch to support outcalling features, such as Find Me, Call Me, and so on.
- **Return to Operator:** Enables callers to dial 0 (zero) during Call Answer to transfer the call to an operator. If the operator does not answer the call, callers hear the greeting activated for the subscriber mailbox.
- **Transfer to Messaging:** The Avaya Communication Manager software provides a feature to transfer to messaging, known also as Transfer to AUDIX. This feature allows an associate, such as an administrative assistant who receives a call either because the assistant is the first coverage path or because the caller pressed zero from a mailbox, to transfer the caller directly to the mailbox associated with the originally dialed number. The transferring party does not have to re-enter the originally called number, nor does that telephone ring again. This is supported with Modular Messaging using a QSIG integration. For other integrations, or other Private Branch Exchanges (PBXs), Modular Messaging can use a caller application to transfer a caller directly into a mailbox.

Switch integration matrix

[Table 25](#) provides information on the support the different SWINs provide to Modular Messaging features and switch features.

Table 25: Switch integration matrix

Features	DSE	T1/E1 QSIG	H.323	SIP	Analog/ RS232
System Forward to Personal Greeting A subscriber's forwarding condition is determined by the PBX programming.					
• All Calls	Yes	Yes	Yes	Yes	Yes
• Ring / No Answer	Yes	Yes	Yes	Yes	Yes
• Busy	Yes	Yes	Yes	Yes	Yes
• Busy / No Answer	No	Yes	Yes	Yes	No
Station Forward to Personal Greeting Subscribers control the forwarding condition from their phones.					
• All Calls	Yes	Yes	Yes	Yes	No
• Ring / No Answer	No	Yes	Yes	Yes	No
• Busy	No	Yes	Yes	Yes	No
• Busy / No Answer	No	No	No	No	No
Automated Attendant	Yes	Yes ¹	Yes ¹	Yes ¹	Yes
Direct Call	Yes	Yes	Yes	Yes	Yes
External Call ID (ANI)	Yes	Yes	Yes	Yes	No
Internal Call ID	Yes	Yes	Yes	Yes	Yes
MWI	Yes	Yes	Yes	Yes	Yes
Multiple Call Forward	Yes	Yes	Yes	Yes	Yes
Multiple Greetings	Yes	Yes	Yes	Yes	Yes
Outcalling	Yes	Yes ²	Yes ²	Yes ²	Yes
Return to Operator	Yes	Yes	Yes	Yes	Yes
Find Me	Yes	Yes	Yes	Yes	No

Table 25: Switch integration matrix

Features	DSE	T1/E1 QSIG	H.323	SIP	Analog/ RS232
Call Me	Yes	Yes	Yes	Yes	Yes
Fax	Yes	Yes	No	Yes	Yes
Queuing	No	No	No	Yes	No
Forward to a Vector	Yes	Yes	Yes	Yes	Yes
Forward from a Vector to VDN	Yes	No	No	No	Yes
Transfer to Messaging ³	No	Yes ⁴	Yes ⁴	Yes ⁵	N/A
Record to Messaging ³	No	Yes	Yes	Yes	No
Priority Ringing	Yes	No	No	No	N/A
OAN for Modular Messaging—Microsoft Exchange	Yes	Yes	No	Yes	N/A
N+1 - Redundancy	Yes	Yes	Yes	Yes	N/A
TTY	Yes	Yes	No	No	N/A

1. If Automated Attendant transfers an External Call to an extension, CallParty ID is not passed until the call is answered.

2. Outcalling to pagers might fail.

3. A switch feature.

4. Applicable for Modular Messaging Release 1.1 SP3 and later.

5. Applicable to Modular Messaging Release 3 and later.

Signaling

Signaling is required to set up, clear, and supervise telephone connections. With analog telephone lines, digital currents (DCs) perform signaling by using protocols such as E&M, loopstart, and wink start.

Digital trunks must convey signaling information in a digital format. They can use an analog protocol or a protocol developed specifically for digital networks, such as QSIG. Modular Messaging supports the QSIG protocol with T1 and E1 trunks.

Modular Messaging supports the CCS digital signaling protocol.

Common Channel Signaling

CCS uses one or more channels to transmit signaling information for the remaining channels in the trunk. Non-signaling channels are known as bearer channels, and signaling channels are known as data channels. Therefore, for T1 there are 23 bearer channels and 1 data channel known as 23B+D. For E1, there are 30 bearer channels and 1 data channel known as 30B+D. Various signaling protocols can be conveyed in the D channel.

With QSIG, Modular Messaging uses QSIG supplementary services (ISO compatible) to convey integration information and to support MWI and transfers.

Hunt groups

A hunt group is a preprogrammed collection of extensions that is configured on the switch. A single pilot number presents a call to one of the available ports within the hunt group. Hunt groups can be designated for specific purposes, for example, incoming only or outgoing only. The simplest hunt groups are linear (available ports are hunted in sequential order).

When planning for Modular Messaging, use hunt groups to balance the load on voice ports. This is important because multiple MAS units can be installed with multiple telephony cards. For more information, see [Hunt algorithm](#) on page 359.

Types of hunt groups

Some common types of hunt groups are:

- Linear call distribution

Calls start at the first port. When the first port is busy with the first call, the next call goes to the second port. If the first port becomes free, the next call goes to the first port, and so on.

- Uniform call distribution (UCD)

Calls start at the first port. Subsequent calls go sequentially to the second, third, and fourth ports, and so on, regardless of whether earlier ports become available. The first port does not receive another call until all ports have taken a call.

- Automatic call distribution (ACD)

Calls go to the port that has been idle the longest. For example, if the first port has been idle for 30 seconds, the second for 50 seconds, and the third for 40 seconds, the first call goes to the second port.

Avaya recommends ACD only with DSE integration using Nortel switches and when support for more than 18 ports is required. Avaya does not recommend ACD with any other integration.

- Circular call distribution

In circular call distribution, the switch has the ability to remember the last busy port. When a call comes in, it goes to the last busy port. Subsequent calls go to the first port in the group and then sequentially go to the second, third, and fourth ports, and so on.

Chapter 9: Support for message and call notification

This chapter describes the message and call notification mechanisms that Avaya Modular Messaging provides to subscribers.

This chapter includes the following topics:

- [Message notification](#) on page 221
- [Call notification](#) on page 231

Message notification

Message notification mechanisms provided by Modular Messaging include:

- Message Waiting Indicator (MWI)
- Call Me
- Notify Me - Automatic

The total notification capacity for a Modular Messaging system is affected by the usage of each message notification mechanism.

Message notification capacities

Each subscriber can be enabled with up to three notification mechanisms: MWI, Call Me, and Notify Me. The total combination of enabled notification mechanisms (MWI, Call Me, and Notify Me) must be less than the message notification capacity for the system. If a single subscriber is enabled with all three notification mechanisms, then it counts as three against the total system capacity. Subscribers that are not enabled with MWI, Call Me, or Notify Me can rely on the notification mechanisms provided by the GUI clients.

Modular Messaging—MSS supports up to a maximum of 20,000 subscribers in a voice mail domain. Each of these subscribers can be enabled with one notification mechanism.

Note:

In Modular Messaging Release 3 and later, MSS—H, the high-availability configuration, supports a maximum of 20,000 subscribers. However, MSS—S, the standard-availability configuration, supports a maximum of 5,000 subscribers. Each of these subscribers can be enabled with one notification mechanism.

Modular Messaging—Exchange and Modular Messaging—Domino support up to a maximum of 100,000 subscribers in a voice mail domain. Of these, 12,000 subscribers can be notification-enabled on Modular Messaging—Exchange, and 1,200 on Modular Messaging—Domino.

Subscribers can be notification-enabled through system administration. In Modular Messaging—MSS, administrators can use a COS attribute to disable notification for subscribers that cannot receive notification. In Modular Messaging—Exchange and Modular Messaging—Domino, administrators disable notification for subscribers by means of an Advanced Properties setting.

Message Waiting Indicator

MWI is a method of alerting subscribers when messages that meet specified criteria arrive in their mailboxes. Subscribers are alerted by either a lamp indicator on the telephone or an audible tone (stutter dialtone) when they pick up the receiver. The indicator is cleared when a subscriber accesses the message and the message moves out of the New message category. Subscribers can set up rules for using MWI in Subscriber Options or Web Subscriber Options. For example, they can choose to be notified only when they receive urgent voice messages.

With Modular Messaging—MSS, broadcast messages do not activate MWI.

An MWI Service provides message waiting indication for the voice mail domain (VMD). The MWI Service communicates with the MAS and the Mailbox Monitoring service. The Mailbox Monitoring Service receives notifications from the message store when the subscriber mailbox changes. The MWI Service then determines when the indicator on the telephone of a subscriber needs to be turned on or off.

Note:

The Call Me Service and MWI Service must be installed on the same MAS and must be set up to share the same Mailbox Monitoring Service.

Using Q.Signaling (QSIG), H.323, and Session Initiation Protocol (SIP) SWINs, the switch can query the MAS about the MWI status of specific extensions. If the MAS is available, the individual MWI status of the requested extensions is sent across to the switch.

Using MWI

In Subscriber Options, subscribers set up rules for using MWI on the Assistant page. MWI rules are created by selecting values in the following rule description:

“If [*message type*] messages, with [*importance*], have arrived, set my message waiting indicator.”

An example rule might be:

“If [*voice*] messages, with [*high importance*], have arrived, set my message waiting indicator.”

For more information on setting rules for using MWI in Subscriber Options, see *Avaya Modular Messaging Subscriber Options*.

Subscribers can also create rules for using MWI on the MWI page in Web Subscriber Options. MWI rules are created by selecting values in the following rule description:

"If [*any new message*] with [*any importance*] have arrived, set my message waiting indicator."

For more information on setting rules for using MWI in Web Subscriber Options, see the online Help system provided with the Web Subscriber Options application.

Subscribers can enable or disable MWI rules in Subscriber Options or Web Subscriber Options. When messages satisfy an MWI rule, subscribers are alerted by either a lamp indicator on the telephone or an audible tone (stutter dialtone) when they pick up the receiver. The indicator is cleared when they open the message in the e-mail client or save or delete the message by using the TUIs.

Subscribers who use the Avaya IP Softphone application to access Modular Messaging messages can use the Picture of Phone tab to view MWI.

MWI in offline mode

New messages, including Call Answer messages, will not activate MWI if those messages are received when either the message store or the MAS on which the MWI Service resides is not accessible. These messages activate MWI only when both are operational again.

Configuring MWI

Administrators can use the VMSC tool on the MAS to enable MWI at the system level. In Modular Messaging—MSS, once MWI is enabled for the system, administrators can edit the MWI COS parameter on the MSS, to control the number of subscribers enabled for MWI. In Modular Messaging—Exchange, administrators enable MWI for subscribers by means of an Advanced Properties setting.

MWI-enabled subscribers can set up rules for MWI from Subscriber Options or Web Subscriber Options. The rules can be enabled or disabled in Subscriber Options or Web Subscriber Options.

Refreshing MWI

Modular Messaging provides system administrators with the ability to either request an on-demand MWI refresh or to set scheduled refresh for a mailbox or a range of mailboxes. The system administrator can schedule MWI refreshes in the VMSC. While scheduling refreshes, the administrator can specify the following information regarding the refresh:

- Time of day when the refresh operation must be performed
- Days of the week when the refresh operation must be performed
- Priority of the refresh operation

Modular Messaging provides system administrators with the ability to request an on-demand MWI refresh for a mailbox or a range of mailboxes. The system administrator can manually start MWI refreshes from the VMSC utility. These requests for MWI refresh will cause MWI status updates to be sent from Modular Messaging to the switch. When a range of mailboxes is specified, Modular Messaging will send across the MWI on/off status for the individual mailboxes to the switch.

Resetting MWI

Modular Messaging provides system administrators with the ability to either set scheduled MWI update or to request an on-demand MWI update for a mailbox, a range of mailboxes, or all mailboxes in a voicemail domain. At the end of a successful MWI update, the MWI service is automatically reset.

The system administrator can schedule MWI updates or manually start MWI updates in the VMSC. For more information on MWI updates, see the MAS Administration Guide.

Note:

Automated update schedule could impact the performance of the Modular Messaging system. If there are no known issues, Avaya recommends customers to use the on-demand MWI update. Avaya also recommends that necessary updates be done at non-peak hours, not at midnight, when the MSS backup is done, and not during the hours when tracing jobs are scheduled to run.

Modular Messaging also provides customers with the ability to manually reset MWI by restarting the MWI service to ensure that:

- MWI always reflects the correct status of new messages
- The state of the MWIs on the switch synchronizes with that of the Modular Messaging MWIs

Manual resetting of MWI is available with Modular Messaging systems that use any of the supported SWINs. For information on the various SWINs supported by Modular Messaging, see [Telephony concepts](#) on page 207.

When any discrepancy in the MWI state is noticed, administrators can restart the MWI service and refresh the MWI states. Restarting the MWI service resets each MWI to its correct state.



Important:

Manually resetting the MWI by restarting the MWI service significantly impacts performances of the Modular Messaging system and the switch. Avaya advises that customers use this feature only when absolutely necessary, such as after a PBX reboot.

Call Me

With Call Me enabled, Modular Messaging calls subscribers at a designated telephone number or telephone list when subscribers receive a message that meets specified criteria. The criteria for requesting Call Me are set by subscribers through rules. For example, subscribers can choose to be informed of all urgent messages that arrive in their mailboxes during the morning commute.

Subscribers can designate a list of telephone numbers for Call Me. If there is no answer at the first number in the list, a call is directed to the next number in the list and so on, until the subscriber answers. To answer a Call Me call, the subscriber logs in to Modular Messaging and reviews the message or messages.

The Call Me Server includes a Call Me service and a Mailbox Monitoring service for monitoring subscriber mailboxes. The Mailbox Monitoring service periodically checks subscriber mailboxes for new messages that meet the criteria set for Call Me. Administrators can set a system-wide minimum polling interval for the Mailbox Monitoring service checks. Subscribers can also configure the polling interval for their mailboxes. However, they can configure the polling interval only to a value greater than the system-wide minimum. For example, if the system-wide minimum is set to 3, subscribers can set the polling interval for their mailboxes only to a value greater than 3. If a new message arrives between polling intervals, it will only be detected on the next check.

If required, a subscriber can configure Call Me multiple times with different criteria. For example, subscribers can configure to be notified of all messages on Fridays, when they typically work away from the office, in addition to being informed during their daily commute.

When the Mailbox Monitoring service detects a message that meets subscriber-specified criteria, the Call Me Server dials the numbers in the telephone list of the subscriber.

Each number in the list can be configured to be called once or multiple times. If configured to be called once, when the call to that number has been answered the number will not be called again regardless of whether any acknowledgement to the call is received, or not. For example, if a specified cell phone number is called:

- If the call is not answered, the number can be called once again.
- If the call is answered but the subscriber disconnects, the number cannot be called again.
- If the call is diverted to the voice mail feature of the cell phone, the number cannot be called again as the diversion is counted as answering the call.

If the call remains unanswered after all numbers in the list have been tried, a retry interval comes in to effect before the list is traversed again. Subscribers can set the retry interval to a value equal to or greater than the system-wide minimum.

During the retry interval, the polling for new messages applicable to this specific criterion is also suspended. A new message received during the retry interval will not trigger an outcall because the subscriber has requested not to be called more frequently than their configured retry interval.

Modular Messaging stops the Call Me calls when subscribers log in to their mailboxes or when subscribers opt to stop the notification when they attend the Call Me call. After the subscriber logs in to the mailbox or opts to stop the Call Me calls, only the next message that meets the specified criteria will trigger Call Me again.

The Call Me call allows recipients to identify a call as a 'nuisance call', if their number is being called by mistake. If the recipient opts to stop notification in this manner, the corresponding criterion is disabled to prevent further unwanted calls.

Note:

Modular Messaging—Avaya Message Storage Server (MSS) subscribers cannot activate Call Me for corporate e-mail messages that are received in a separate mailbox on the corporate e-mail server.

For all Modular Messaging message stores, a broadcast message will activate Call Me.

Some considerations that are applicable to Call Me include:

- The Call Me Service and MWI Service must be installed on the same messaging application server (MAS) and must be set up to share the same Mailbox Monitoring service.
- The Call Me Service, MAS units, and e-mail server (Microsoft Exchange and IBM Lotus Domino message stores) must have their system clocks synchronized with their respective message stores by using a time service.



SECURITY ALERT:

The Call Me feature can be misused to commit toll fraud. When a message triggers Call Me, the MAS generates an outgoing call to a list of telephone numbers that subscribers provide, thus making the system vulnerable to toll fraud. In Modular Messaging—MSS, the Call Me feature is enabled at the Class-of-Service (COS) level by means of a COS setting. Administrators are advised to enable Call Me, by the relevant COS, for only those subscribers that truly require this method of notification. Administrators can take additional security measures such as assigning a restrictive Private Branch Exchange (PBX) COS to the PBX ports used to make the outcall or requiring account codes or authorization codes. For more information on toll fraud, see *Modular Messaging and Security on the Avaya Modular Messaging Release 3 Documentation*, CD-ROM. In Modular Messaging—Exchange and Modular Messaging—Domino, the Call Me feature is enabled by means of an Advanced Properties setting.

Configuring Call Me

Administrators use the Voice Mail System Configuration (VMSC) tool on the MAS to enable Call Me at the system level. In Modular Messaging—MSS, once Call Me is enabled for the system, administrators can edit the Call Me COS parameter on the MSS to control the number of subscribers enabled for Call Me.

Subscribers can enable or disable the Call Me feature by using Subscriber Options or Web Subscriber Options or from the Modular Messaging TUIs.

Call Me enabled subscribers can set up rules for Call Me on the Assistant page in Subscriber Options or on the Call Me page in Web Subscriber Options. The rules can be enabled or disabled by using Subscriber Options and Web Subscriber Options.

For more information on creating Call Me rules by using Web Subscriber Options, see the online Help system provided with the Web Subscriber Options application.

Creating Call Me rules

In Subscriber Options, a Call Me rule is created by selecting values in the following rule description:

"When [*schedule*] is active, if [*message type*] with [*importance*], from [*sender*] have arrived, call telephone numbers in [*phone list*] within [*minutes*] and then every [*interval*]."

An example rule might be:

"When [*commute time*] is active, if [*new voice messages*] with [*high importance*], from [John Smith] have arrived, call telephone numbers in [*my personal list*] within [*15 minutes*] and then every [*20 minutes*]."

For more information on creating Call Me rules using Subscriber Options, see *Avaya Modular Messaging Subscriber Options*.

Answering Call Me calls

When answering a Call Me call, subscribers are presented with a common Call Me interface. This interface provides options for receiving the call, blocking the call, and logging in to their mailboxes. The options of the Call Me interface are the same for all subscribers, regardless of the telephone user interfaces (TUI) assigned to them.

When Modular Messaging makes a Call Me outcall, it plays the A, B, C, and D tones as part of the outcalling announcement. If Modular Messaging answers a call and detects any (or all) of the A, B, C or D tones, it will assume that the call has been automatically generated and will disconnect.

Using Call Me in offline mode

Outgoing calls from the Call Me feature are not made while either the message store or the MAS on which the Call Me server resides is not accessible. These calls may be made when both are operational again.

Notify Me - Automatic

Modular Messaging includes two forms of Notify Me:

- Notify Me - Automatic, described here, provides enhanced notification of new messages that meet the rules defined by the subscriber. The notification for Call Answer messages is in addition to that provided by the Call Me feature.
- [Caller-requested Notify Me](#) on page 231, provides notification of missed incoming calls if requested by the caller, even when the caller chooses not to leave a message.

When a subscriber mailbox receives a new message that matches subscriber-defined rules, Modular Messaging sends a text message to the e-mail address or places a call to the numeric pager specified by the subscriber for notification. If the notification is a text message to an e-mail address, the notification may result in a page or short message service (SMS) message due to capabilities provided by the pager or the SMS system.

The From field of a Notify Me notification e-mail contains the e-mail address of the Modular Messaging subscriber. The e-mail address depends on the message store:

- With Modular Messaging—MSS, this e-mail address has the form `firstname.lastname@msshhost.company.com`, where `msshhost.company.com` is the Domain Name Server (DNS) name of the MSS and can be replaced with an e-mail host alias name. This notification e-mail is sent from the MSS server to either a single specified e-mail gateway or using MX routing, provided by the customer's DNS infrastructure.
- With Modular Messaging—Exchange and Modular Messaging—Domino, this e-mail address is the subscriber's corporate e-mail address. Typically, this address is of the form `firstname.lastname@company.com`.

For more information, see [Primary mailbox address](#) on page 174.

Notify Me capabilities

Notify Me - Automatic includes the following capabilities:

- Configuration through the desktop computer or web interface

Modular Messaging subscribers can configure Notify Me using a desktop PC running Subscriber Options, or from a computer on the network with access to Web Subscriber Options. After Notify Me is configured, subscribers may enable or disable Notify Me from Subscriber Options, Web Subscriber Options, or from any Modular Messaging TUI (Aria, AUDIX or Serenade).

- Rule-based selection of which messages trigger notification

Notification can be triggered by call-answer messages, internally sent messages, broadcast messages, voice, text, e-mail, or fax messages. By setting the subscriber-defined rules, the subscriber can choose whether to receive notification only during scheduled times, only of certain message types, or only when the messages were sent by particular senders.

- Enabling or disabling from the desktop computer or Modular Messaging TUI

Once Notify Me is configured, subscribers may enable or disable Notify Me from Subscriber Options, Web Subscriber Options, or from any Modular Messaging TUI (Aria, AUDIX or Serenade).

- E-mail gateway support

Modular Messaging can send notification messages to e-mail gateways, including third-party SMS gateways and pager gateways.

- Internet support

Notification messages can be sent to any Internet e-mail address configured in the notification address field.

- Notify Me support for pagers

The Notify Me feature supports notification messages to pagers that have an e-mail address. The feature also supports notification as calls to numeric pagers.

- Notify Me in offline mode

When the mail server is offline, messages are held in queue and cannot arrive in the mailbox. When the mail server is back online, held messages will be delivered into the mailbox and a notification will be sent for any new message that matches an automatic notification rule. If a message was sent during a scheduled notification time, but its arrival was delayed until a non-scheduled notification time because the mail server was offline, notification would not be sent for that message.

Configuring Notify Me - Automatic

The Notify Me-Automatic feature for Modular Messaging Release 3.1 is facilitated by the Call Me feature. Call Me service must be enabled and running for notifications to occur. See [Call Me](#) on page 225.

In Modular Messaging—MSS, administrators can use the Notify Me COS parameter on the MSS to enable the Notify Me feature at the COS level. In Modular Messaging—Exchange and Modular Messaging—Domino, administrators can enable the Notify Me feature by means of an Advanced Properties setting.

Notify Me-enabled subscribers can set up rules for Notify Me - Automatic on the Assistant page in Subscriber Options or on the Notify Me page in Web Subscriber Options. Subscribers can create Notify Me rules by selecting values in rule descriptions for automatic call notification. Subscribers cannot create Notify Me rules using a Modular Messaging TUI.

Subscribers can enable or disable the Notify Me feature by using Subscriber Options or Web Subscriber Options. If notification rules have been defined, subscribers may also enable or disable the Notify Me feature using any Modular Messaging TUI.

Creating Notify Me - Automatic rules

In Subscriber Options, subscribers set up automatic notification rules for e-mail notifications by selecting values in the following rule description.

"When schedule *[schedule]* is active, if *[message type]* with *[importance]*, from *[sender]* have arrived then send *[an email]* to *[e-mail address]* with this *[message]* and *[subject]*."

Further, "*[message]*" has the following format:

"A *[Priority]* priority *[Type]* message was left from *[Sender]* at *[Time]* on *[Date]*."

An example rule might be:

"When schedule *always* is active, if *any new messages* with *any importance*, from *anyone* have arrived then send *an email* to *anon@avaya.com* with this *message* and *subject*."

Similarly, for setting automatic notification rules for numeric pager notifications subscribers can select values in the following rule description:

"When schedule *[schedule]* is active, if *[message type]* with *[importance]*, from *[sender]* have arrived then send *[a numeric page]* to *[this pager number]* with this *[message]*."

Note:

Subscribers can enable multiple automatic notification rules. If more than one notification rule is active and a message arrives in the mailbox that matches two or more rules, two or more notifications may be generated. For example, if a subscriber creates one rule that generates e-mail notification each time a call answer message is received, and another rule that generates e-mail notification each time a voice message is received, two e-mail notifications will be generated.

For more information on creating rules for Notify Me - Automatic in Subscriber Options, see *Avaya Modular Messaging Subscriber Options*.

Note:

For Modular Messaging Release 3.1 and Subscriber Options 3.1 or later, there are some differences in the automatic notification rules. For example, the Size token is no longer available to be included in a notification message, Notify Me configurations from the previous release need to be reset, and the default message types have changed. See the online Help system provided with Subscriber Options for more information.

Specification of rules using Web Subscriber Options is similar to the specification using Subscriber Options described above. For information on creating rules for Notify Me - Automatic in Web Subscriber Options, see the online Help system provided with the Web Subscriber Options application.

Call notification

Call notification includes the following features:

- Caller-requested Notify Me
- Find Me
- Intercom paging
- Call screening from the Automated Attendant
- One-number connectivity
- Multiple notifications

Caller-requested Notify Me

Modular Messaging includes two forms of Notify Me:

- Caller-requested Notify Me, described here, provides notification of missed incoming calls if requested by the caller, even when the caller chooses not to leave a message.
- [Notify Me - Automatic](#) on page 228, provides enhanced notification of new messages that meet the rules defined by the subscriber. The notification for Call Answer messages is in addition to that provided by the Call Me feature.

With Caller-requested Notify Me, subscribers can enable a service that prompts callers to request that the subscriber is notified of their calls by sending a message to the subscriber. The caller does not have to leave a message for this notification to happen. When caller-requested notification is enabled, callers hear the following prompt:

“To have <name of subscriber> notified, press **[9]** now”

When a caller requests that the subscriber be notified of a missed call, Modular Messaging sends a text message to the e-mail address specified by the subscriber for notification. This may result in a page or SMS message due to capabilities provided by the pager or the SMS system. The notification message can contain the telephone number of the caller as well as additional information.

Once enabled, Caller-requested Notify Me sends a notification of the call even if the [Notify Me - Automatic](#) feature is disabled or if the caller does not leave a message. The caller-requested notification cannot be restricted to particular callers or limited by a schedule.

A caller-requested notification message also may be sent to the inbox of a subscriber. This notification message can be used in the following ways:

- Third-party notification applications can monitor the inbox of a subscriber and send a notification message when a notification message is detected. For example, Microsoft Outlook provides a way of editing Exchange server rules that execute even when Microsoft

Outlook is not in use or connected to the Exchange server. Such rules can be made to forward an incoming message or send a notification to a specified e-mail address, such as a gateway to an SMS network (applicable only to Modular Messaging—Exchange).

- Subscribers can access their inboxes from a desktop computer or telephone and review their notification messages.
- Subscribers can keep a record of Notify Me requests that may include caller information, such as the telephone number of the caller and the time the call arrived.

For information on the capabilities of Notify Me, see [Notify Me capabilities](#) on page 228.

Configuring Caller-requested Notify Me

In Modular Messaging—MSS, administrators can use the Notify Me COS parameter on the MSS to enable the Notify Me feature at the COS level. In Modular Messaging—Exchange and Modular Messaging—Domino, administrators can enable the Notify Me feature by means of an Advanced Properties setting.

Modular Messaging subscribers can configure Caller-requested Notify Me using a desktop PC running Subscriber Options, or from a computer on the network with access to Web Subscriber Options. After Caller-requested Notify Me is configured, subscribers may enable or disable Caller-requested Notify Me from Subscriber Options, Web Subscriber Options, or from any Modular Messaging TUI (Aria, AUDIX or Serenade).

To control the destination and content of the notification message, subscribers can enable or disable the Caller-requested notification rules in Subscriber Options or Web Subscriber Options.

The caller-requested notification cannot be restricted to particular callers or limited by a schedule.

Creating Caller-requested Notify Me rules

Notify Me-enabled subscribers can create or modify rules for Caller-requested Notify Me on the Assistant page in Subscriber Options or on the Notify Me page in Web Subscriber Options. Subscribers can create Notify Me rules by selecting values in rule descriptions for Caller-requested call notification.

In Subscriber Options, subscribers set up Caller-requested notification rules by selecting values in the following rule description.

“When anyone calls and requests I am notified, send a notification message with this [*message body*] and with this [*subject*] to [*e-mail address*] and [*don’t save a copy*] in my Inbox.”

An example rule might be:

“When anyone calls and requests I am notified, send a notification message with this [*caller’s name*] and with this [*notification message*] to [*anon@avaya.com*] and [*don’t save a copy*] in my Inbox.”

For more information on creating Caller-requested notification rules in Subscriber Options, see *Avaya Modular Messaging Subscriber Options*. For more information on creating rules for Caller-requested Notify Me in Web Subscriber Options, see the online Help system provided with the Web Subscriber Options application.

Find Me

Find Me is a feature that redirects unanswered calls to a list of telephone numbers specified by the subscriber. With Find Me, subscribers can set up schedules (times for rules) with an associated list of telephone numbers for forwarding unanswered calls. Find Me is implemented only for calls that are not answered because the extension rings, and there is no answer, and not for calls that are not answered because the extension is busy.

When unanswered calls are directed to Modular Messaging, the system checks to see if Find Me is enabled, and, if so, whether the call has arrived within an active schedule. If the call has arrived within an active schedule, Modular Messaging asks callers if they want to leave a message or have the system try to locate the subscriber; in this case, the system prompts callers to record their name and then plays the Please Hold prompt.

Depending on the type of integration used, callers will hear a tone or music or silence when on hold. For example, in a QSIG integration, callers hear the music on hold music when on hold. In the meantime, the system dials the first Find Me number in the telephone list associated with the schedule. This process is known as making an enquiry call. If the call is answered, Modular Messaging responds with the name of the calling party and provides the recipient with an opportunity to accept or reject the call. If the recipient answers the call, the system completes the transfer. If the call is unanswered, Modular Messaging calls the next number in the Find Me list. If it reaches the end of the list and all the calls are either unanswered or rejected, Modular Messaging allows the caller to leave a message.

When Modular Messaging makes a Find Me outcall, it plays the A, B, C, and D tones as part of the outcalling announcement. These tones represent, dial with full call progress, listen for busy, invalid number, and no answer or connect.

Note:

Find Me is not supported for analog integrations.

Depending on the integration type, Find Me uses one or two ports:

- On systems that use DSE integrations, Find Me uses only one port. The same port that handles the incoming call is also used to complete the transfer.
- On systems that use QSIG, SIP, and H.323 integration, Find Me uses two ports.

On systems that use QSIG integration, one port is used for the incoming call and the other port is used to dial the called subscriber and to attempt transfer. The two ports used by Find Me must be in the same MAS. The ports are used for the duration of the transfer attempt. If the transfer is unsuccessful, the second port acquired for the enquiry call is dropped. If the transfer attempt is successful, then the transfer will be completed and path replacement will ensure that both MAS ports are dropped.

Note:

Certain switch configurations cause path replacement to fail; both ports on the MAS stay busy for the duration of the successfully transferred call. To avoid such switch-specific failure scenarios, make sure that the switch configuration is implemented as described in the relevant configuration note. Configuration notes are available from a Modular Messaging support representative or from the Avaya Support Center at <http://www.avaya.com/support>.



SECURITY ALERT:

The Find Me feature can be misused to commit toll fraud. When a call triggers Find Me, the MAS generates an outgoing call to a list of telephone numbers that subscribers provide, thus making the system vulnerable to toll fraud. In Modular Messaging—MSS, the Find Me feature is enabled at the Class-of-Service (COS) level by means of a COS setting. Administrators are advised to enable Find Me, by the relevant COS, for only those subscribers that truly require this method of notification. Administrators also take additional security measures such as assigning a restrictive PBX COS to the PBX ports used to make the outcall, or requiring account codes or authorization codes. For more information on toll fraud, see *Modular Messaging and Security on the Avaya Modular Messaging Release 3 Documentation*, CD-ROM. In Modular Messaging—Exchange and Modular Messaging—Domino, the Find Me feature is enabled by means of an Advanced Properties setting.

Configuring Find Me

In Modular Messaging—MSS, administrators use the Find Me COS parameter to determine which subscribers are enabled for Find Me. Subscribers can enable or disable the Find Me feature in Subscriber Options or Web Subscriber Options or from the Modular Messaging TUIs.

Find Me-enabled subscribers set up rules for Find Me on the Assistant page in Subscriber Options or on the Find Me page in Web Subscriber Options.

For more information on creating rules for using Find Me in Web Subscriber Options, see the online Help system provided with the Web Subscriber Options application.

Subscribers can enable or disable the Find Me rules in Subscriber Options or Web Subscriber Options.

Creating Find Me rules

In Subscriber Options, a Find Me rule is created by selecting values in the following rule description:

"When anyone phones me when schedule [*schedule name*] is active call phone numbers in [*phone list*]."

An example rule might be:

"When anyone phones me when schedule [*weekend schedule*] is active call phone numbers in [*personal list*]."

For more information on setting rules for using Find Me in Subscriber Options, see *Avaya Modular Messaging Subscriber Options*.

Using Find Me in offline mode

Find Me information (such as Find Me rules, schedules, and telephone lists) uses the message store to keep the master copy and is cached on each MAS.

When a call comes in that requires Find Me, the MAS checks to see if the cache is up to date. If not, the MAS reads the updated information from the message store, updates the cache, and then applies the rule.

When a subscriber changes a Find Me rule, the cache on an MAS is not updated until the MAS handles a call for the subscriber. If the message store cannot be accessed when that call arrives, the MAS cannot reach the message store and cannot check to see if it has the most recent Find Me information. In this case, the MAS will use the last available information that is cached on the MAS to control Find Me.

Intercom Paging

Subscribers can set Modular Messaging to contact them through Intercom Paging when they are not at their desks. Once subscribers are paged, they must return to their extensions to pick up the call. If subscribers do not respond to the page, the system transfers the callers to the subscriber's mailbox. As is the case with Find Me, Intercom Paging increases the probability of establishing a live connection on the first attempt.

Where Find Me is typically used when a subscriber is out of the office, Intercom Paging is used when the subscriber is in the office but is not available to answer a call.

Note:

Modular Messaging supports station-level paging. For Modular Messaging to be able to support trunk-level paging, customers must provide additional hardware between Modular Messaging, the switch, and the paging system.

Configuring Intercom Paging

Administrators can use the VMSC tool on the MAS to enable Intercom Paging at the system level. In Modular Messaging—MSS, once Intercom Paging is enabled for the system, administrators can edit the page through PBX COS parameters to control the number of subscribers enabled for Intercom Paging. Administrators can use the Web-based administration pages of the MSS to edit subscribers and to configure Intercom Paging (On, Off, Manual, or Automatic). In Modular Messaging—Exchange and Modular Messaging—Domino, once

Intercom Paging is enabled for the system, administrators can enable or disable Intercom Paging by means of an Advanced Properties setting.

Intercom Paging-enabled subscribers configure Intercom Paging options (On, Off, Manual, or Automatic) from the Modular Messaging Aria TUI or from Web Subscriber Options or from Subscriber Options.

Call screening from the Automated Attendant

Subscribers can configure their mailboxes to support call screening from the Automated Attendant. Call screening is a Modular Messaging Call Answering option that requires callers to announce themselves before subscribers answer their calls. Subscribers can then decide whether to take the call. Call screening screens only those calls that come through the Automated Attendant and is not applicable to direct inward dialing (DID) calls.

If subscribers have chosen to screen calls but are not available to answer screened calls, callers have the choice of leaving a message, being diverted to a different extension, or transferring to the operator.

Note:

Screening calls from the Automated Attendant has no relation to the Find Me call screening capability.

Configuring call screening

In Modular Messaging—MSS, administrators can use the Call screening COS parameter to determine which subscribers are enabled for call screening. In Modular Messaging—Exchange and Modular Messaging—Domino, administrators can enable the Call screening feature by means of a Advanced Properties setting.

Subscribers can enable or disable call screening from the Modular Messaging Aria TUI, from Web Subscriber Options, and from Subscriber Options.

Note:

For Call screening from the Automated Attendant to be available, the Automated Attendant must be enabled at the system level. Administrators can use the VMSC tool on the MAS to enable the Automated Attendant. For more information, see the Modular Messaging, Messaging Application Server administration guides, available on the *Avaya Modular Messaging Documentation* CD-ROM.

One-number connectivity

Modular Messaging enables subscribers to combine notification features.

By combining features, subscribers can offer their callers a single number where they can be reached for all purposes.

Multimedia messaging allows subscribers to have a single number for voice and fax calls. Find Me allows callers to the business line to still reach the subscribers on their cell phones, remote or virtual office from that single number.

When subscribers offer their callers the option of Caller-initiated Notify Me, callers can trigger a notification during the same session as their Call Answer session, and they do not need to go through a second step of locating additional contact information and issuing a notification request.

Multiple notifications

A subscriber receives multiple notifications if a caller requests a notification and leaves a message. This is because Modular Messaging notification mechanisms are independent of each other. For example, consider that a subscriber has provided a cell number where the subscriber can be reached at when Find Me is activated. When a caller calls this subscriber and this subscriber is away, the cell phone rings. If the subscriber chooses not to answer, the caller is given the option to leave a message and page a notification. Once the caller disconnects, the MWI on the desktop set is lit, and the subscriber receives two notification messages—one for the Call Answer message and one for the Caller-requested message to the pager. Call Me makes an outcall to the cell phone number based on the arrival of the new urgent message. While the subscriber is away, the subscriber's e-mail client indicates that a new message has arrived.

Support for message and call notification

Chapter 10: Designing voice mail domains

This chapter discusses the key points to consider when designing voice mail domains (VMDs).

This chapter includes the following topics:

- [General rules for voice mail domains](#) on page 240
- [Rules for Message Storage Server messaging environments](#) on page 244
- [Rules for Microsoft Exchange messaging environments](#) on page 246
- [Rules for IBM Lotus Domino messaging environments](#) on page 249

General rules for voice mail domains

Some general rules that apply to VMDs of all Avaya Modular Messaging versions are as follows:

Note:

For information on the Modular Messaging versions, see [Modular Messaging versions](#) on page 23.

Messaging application server (MAS)

- Each MAS can belong to only one VMD.
- A VMD can contain multiple MAS units.

Subscriber

- Each voice mail subscriber can belong to only one VMD.

Data Collection Tool (DCT)

- Only a single DCT file can be created for all the MAS units in the VMD and this file is used for all MAS installations.

Tracing Service

- Although Tracing Service is installed on each MAS in the VMD, there can be only one enabled instance of Tracing Service in the VMD.
- A Tracing Service can provide services to only one VMD.

Message Waiting Indicator (MWI) Service

- Although MWI Service is installed on each MAS in the VMD, there can be only one enabled instance of MWI Service in the VMD.
- An MWI Service can interface to only one switch.
- An MWI Service can provide services to only one VMD.
- An MWI Service uses the Mailbox Monitor Service from the same VMD.
- An MWI Service must be configured along with Call Me Service and Mailbox Monitor Service on the same server.

Call Me Service

- Although Call Me Service is installed on each MAS in the VMD, there can be only one enabled instance of Call Me Service in the VMD.
- A Call Me Service can provide services to only one VMD.

- A Call Me Service uses the Mailbox Monitor Service from the same VMD.
- A Call Me Service must be configured along with MWI Service and Mailbox Monitor Service on the same server.

Mailbox Monitor Service

- Although Mailbox Monitor Service is installed on each MAS in the VMD, there can be only one enabled instance of Mailbox Monitor Service in the VMD.
- A Mailbox Monitor can provide services to only the MWI Service and Call Me Service that belong to its own VMD.
- Mailbox Monitor Service must be configured along with Call Me Service and MWI Service on the same server.

Offline Call Answer Store

- A VMD can contain only one Offline Call Answer Store.
- An Offline Call Answer Store can provide services to only one VMD.
- An Offline Call Answer Store can reside on an MAS. However, for larger systems, Avaya recommends installing the Offline Call Answer Store on a Supplementary Server. For more information, see [Messaging application server load balancing](#) on page 350.

Multiple switches

- A VMD can provide services to multiple switches provided that all the switches share a common dial plan.
- A VMD can provide services to a network of switches provided that:
 - the administrator ensures that the network uses a single switch as a gateway to the VMD
 - the switches are networked using a supported switch networking protocol.
- The MWI Service connects to a single switch that can light the MWI of any other switches associated with the VMD.
- A single switch can support multiple VMDs.

Switch integration

- A VMD can support only a single integration type.
- For H.323 and Session Initiation Protocol (SIP) integrations, an MAS must be on the same local area network (LAN) segment as the Avaya Communications Manager.

Multiple voice mail domains networking

- A VMD can be connected to only one Avaya Message Networking server.
- An Avaya Message Networking server can be connected to multiple VMDs.

Message encoding

- The encoding format that the Modular Messaging system uses to record messages is administered on a VMD basis.
- If administrators change the VMD encoding format, they must make appropriate changes to the following parameters for each Class-of-Service (COS):
 - Maximum Mailbox Size
 - Maximum Call Answer Message
 - Maximum Voice Mail Message
- An MAS supports only one encoding format for recording messages, either the G.711 or the GSM.
- A message store can support both formats, GSM and G.711, for message encoding. For example, an MSS might receive G.711-encoded messages from the MAS and GSM-encoded messages from remote subscribers.

License

- A VMD has a single license key. This license key cannot be used with any other VMD.

Modular Messaging Web Subscriber Options

- A Web server for Web Subscriber Options can support multiple Web Subscriber Options applications.
- A VMD can contain multiple Web servers of Web Subscriber Options.
- A Web server for Web Subscriber Options can be hosted on any of the following servers:
 - An MAS, provided the Modular Messaging system has less than 500 subscribers

Note:

Web Subscriber Options and Web Client cannot be installed on a Supplementary Server. For information on Supplementary Server, see [Supplementary Server](#) on page 242.

- A Web server that also hosts Modular Messaging Web Client.
Only the Modular Messaging—MSS version supports Modular Messaging Web Client.
- A stand alone Web server.

For more information on the Web Subscriber Options requirements, see [Web Subscriber Options requirements](#) on page 410 and [Web Subscriber Options requirements](#) on page 425.

Supplementary Server

- For large systems, Avaya recommends installing the Modular Messaging services on a separate computer, other than an MAS. This separate computer is known as a

Supplementary Server. For more information, see [Messaging application server load balancing](#) on page 350 and [Table 103](#).

Note:

The separate computer recommended for installing the Modular Messaging services was known as Tracing Server in the previous releases of Modular Messaging.

Rules for Message Storage Server messaging environments

Avaya MSS

Topology

- All MAS units must be physically co-located with the MSS.
- All MAS units must be on the same LAN segment as the MSS.

Message store

- An Avaya Message Storage Server (MSS) can host only one VMD.
- A VMD can contain only one MSS.
- Large configuration systems require the MSS—H to be implemented. For more information about when an MSS—H is required, see [Table 102](#).

DCT

- The same DCT file must not be used for multiple systems in a networked environment. The name for the private Windows domain must be unique throughout the entire messaging network, or errors will occur. If the private domain name is duplicated anywhere in the network, all Modular Messaging software must be reloaded on all affected servers to correct the problem. A unique private domain name must be used on each Modular Messaging system.

Directory server

- Each MAS must have a single directory server.
- Each directory server can be a server of more than one MAS.

Fax Sender Service

- Although Fax Sender Service is installed on each MAS in the VMD, there can be only one enabled instance of Fax Sender Service in the VMD.
- A Fax Sender Service can provide services to only one VMD.

Capacity

- A VMD supports a maximum of five MAS units that run the various MAS services like Tracing Service, Call Me Service, MWI Service and Mailbox Monitor Service. The maximum number of MAS units supported includes the additional server in an N+1 configuration.

- When Tracing Service, Offline Call Answer Store, or both are hosted on the Supplementary Server, they do not count toward the maximum MAS units supported.
- The Web server for Modular Messaging Web Client or for Web Subscriber options does not count toward the maximum MAS units supported.

Mailbox Manager

- A VMD can use only one Mailbox Manager database.
- A Mailbox Manager database can provide services to multiple VMDs.

Modular Messaging Web Client

- A Web server for Modular Messaging Web Client can support multiple Modular Messaging systems.
- A VMD can use multiple Modular Messaging Web Client Web servers.
- A Web server for Modular Messaging Web Client is used exclusively for Modular Messaging. This Web server does not support other voice-messaging systems.
- A Web server for Modular Messaging Web Client can be hosted on any server that does not belong to the VMD. The Web server for Modular Messaging Web Client cannot be hosted on an MAS or with other MAS applications or services, such as Tracing Service.

For more information, see [Modular Messaging Web Client requirements](#) on page 408.

Rules for Microsoft Exchange messaging environments

Microsoft Exchange

Topology

- All MAS units must be on the same LAN segment as any peer Microsoft Exchange server.
- All Microsoft Exchange servers must be on the same LAN as the MAS.

Peer Exchange server

- Each MAS has a single primary peer Exchange server. The administrator can configure the MAS to communicate with another Exchange server to act as a peer when the primary peer Exchange server goes offline.
- Different MAS units in a VMD can have different peer Exchange servers.

Directory server

- Different MAS units in a VMD can have different directory servers that are replicas of each other.
- Each directory server can be a server of more than one VMD.

Capacity

- An e-mail server can be a peer server for more than one MAS.
- An e-mail server can be a host to more than one VMD.
- A VMD can have multiple e-mail servers.
- A VMD can contain a maximum of 10 MAS units. A Supplementary Server that hosts Tracing Service, Offline Call Answer Store, or both does not count toward the maximum MAS units supported.

Rules for Exchange 2007 messaging environments

Rules for Microsoft Exchange 2007 messaging environments are:

- Support for Octel Analog Networking will not be available in a native Exchange 2007 environment and hence a voice network using Avaya Message Networking will not be possible in such environments. Octel Analog Networking requires an Exchange 2000/2003 Peer Mail Server to host the gateway. This Peer Mail Server must be the same Exchange server that hosts the Voice Mail Domain mailbox.
- All Exchange 2007 mail servers, either Peers or Non-Peers, must have the 'Mailbox Server' role installed and configured.

- All Exchange 2007 mail servers must comply with the Microsoft guidelines for the provision of Exchange servers providing the 'Hub' role.
- Each MAS can have only one directory server. The directory server must be an Active Directory Domain controller configured as a global catalog.
- A Microsoft Exchange 2007 domain can contain more than one voice mail domain (VMD).
 - If a customer has an existing Exchange Organization configured with a Modular Messaging release 3.0 Voice Mail Domain with Exchange 2000/2003 mail servers, they can add a Modular Messaging release 3.1 Voice Mail Domain with Exchange 2007 mail servers. However, there can be no overlap of Exchange servers between the two Voice Mail Domains until both Voice Mail Domains are running release 3.1. For example, no subscribers in the MM3.0 Voice Mail Domain can have mailboxes on an Exchange 2007 server.
 - Avaya does not recommend nor have they verified a Modular Messaging release 1.1 Voice Mail Domain using Exchange 2000/2003 mail servers in the same Exchange Organization as Exchange 2007 servers.
- A VMD can contain subscribers in different Active Directory sites, provided that subscribers are in the same forest.
- All customers should download and roll out a new Outlook Thick Client, OTC 7.1.229.22 or later, for use with Exchange 2007. The new client will work with all currently supported versions of Outlook and Outlook 2007.

Rules for Exchange 2003 messaging environments

Rules for Microsoft Exchange 2003 messaging environments are:

- Each MAS can have only one directory server. The directory server must be an Active Directory Domain controller configured as a global catalog.
- A Microsoft Exchange 2003 domain can contain more than one VMD.
- A VMD can contain subscribers in different Active Directory sites, provided that subscribers are in the same forest.

Rules for Exchange 2000 messaging environments

Rules for Microsoft Exchange 2000 messaging environments are:

- Each MAS can have only one directory server. The directory server must be an Active Directory Domain controller configured as a global catalog.
- A Microsoft Exchange 2000 domain can contain more than one VMD.

Designing voice mail domains

- A VMD can contain subscribers in different Active Directory sites, provided that subscribers are in the same forest.

Rules for IBM Lotus Domino messaging environments

IBM Lotus Domino

Topology

- An MAS must be on the same LAN segment as the IBM Lotus Domino server.

Domino domain

- Each MAS must have one directory server or cluster per Domino domain in which voice mail-enabled subscribers exist.
- A Domino domain can contain more than one VMD.
- A VMD can contain subscribers in more than one Domino domain.

Peer server

- When customers create a VMD, the peer directory server for the first MAS in the VMD becomes the primary server in the VMD.
- Different MAS units in a VMD can have different peer Domino servers.

Directory server

- Different MAS units in a VMD can have different directory servers that are replicas of each other.
- Each directory server can be a server of more than one VMD.

Capacity

- An e-mail server can be a peer server for more than one MAS.
- An e-mail server can be a host to more than one VMD.
- A VMD can have multiple e-mail servers.
- A VMD can contain a maximum of 10 MAS units. If a dedicated server hosts Tracing Service or Offline Call Answer Store, or both, this server does not count toward the maximum MAS units supported.

Considering the proximity of the switch to e-mail message stores

Microsoft Exchange

IBM Lotus Domino

When implementing Modular Messaging with Exchange or Domino, consider the proximity of the e-mail message store to the switch or communication servers.

MAS units must be located on the same LAN as the message store. If the switch is remotely located, make arrangements to get the traffic from the switch to the site with the e-mail server and MAS units. To accommodate this, extend communication facilities or network traffic from the remote site to a switch at the same location as the e-mail server and MAS units.

Note:

In a Modular Messaging—MSS system, MAS units and the MSS are on the same private LAN and are at the same location as the switch.

Chapter 11: Modular Messaging system capacities

This chapter provides information about the capacities of a voice mail domain (VMD), an Avaya Message Storage Server (MSS), and a messaging application server (MAS).

This chapter contains the following topics:

- [Voice mail domain capacities](#) on page 252
- [Avaya Message Storage Server capacities](#) on page 254
- [Messaging application server capacities](#) on page 256
- [Modular Messaging—Message Storage Server](#) on page 257
- [Modular Messaging—Microsoft Exchange](#) on page 262
- [Modular Messaging—IBM Lotus Domino](#) on page 270

Voice mail domain capacities

[Table 26](#) provides information about the VMD capacities for the different versions of Avaya Modular Messaging.

Table 26: Voice mail domain capacities

Feature	MSS, standard availability MSS—S, Release 3	MSS, high availability, MSS—H, Release 3	Microsoft Exchange, Release 3	IBM Lotus Domino, Release 3.1
Maximum number of MAS units in a VMD ¹	2	5	10	10
Maximum number of message stores per VMD	1	1	No limit	No limit
Total number of MAS voice ports supported per VMD	64	144	240	240
Subscriber mailboxes per VMD ² <ul style="list-style-type: none"> Maximum local subscribers Maximum networked subscribers Message Waiting Indicator (MWI), Call Me, and/or Notify Me³ 	5,000 250,000 5,000	20,000 250,000 20,000	100,000 250,000 12,000	100,000 250,000 1,200
Class-of-Service (COS)	512	512	24	24
Enhanced-list application (ELA) lists	1,000	1,000	NA	NA
List members per ELA Note: ELA lists can be nested to create larger lists.	1,500	1,500	NA	NA
Personal Distribution Lists (PDLs) per subscriber	500 ⁴	500 ⁴	Subject to Microsoft Outlook limitations	Subject to IBM Lotus Domino limitations
List members per PDL	999 ⁴	999 ⁴	Subject to Microsoft Outlook limitations	Subject to IBM Lotus Domino limitations
Maximum number of Caller Applications deployed per VMD ⁵	150 ⁶	150 ⁶	150 ⁶	100
Maximum voice message size ⁷	45.78 MB (default 2.33 MB)			

Table 26: Voice mail domain capacities (continued)

Feature	MSS, standard availability MSS—S, Release 3	MSS, high availability, MSS—H, Release 3	Microsoft Exchange, Release 3	IBM Lotus Domino, Release 3.1
Maximum voice message length ⁷	G.711: 100 minutes (default 5 minutes) GSM: 484 ⁸ minutes (default 25 minutes)			
Maximum Call Answer message size ⁷	45.78 MB (default 2.33 MB)			
Maximum Call Answer message length ⁷	G.711: 100 minutes (default 5 minutes) GSM: 484 ⁸ minutes (default 25 minutes)			
Maximum mailbox size ⁹	64 MB	64 MB	Unlimited	Unlimited
Maximum mailbox size, in minutes ⁷	G.711: 139 GSM: 677	G.711: 139 GSM: 677	Unlimited	Unlimited
Storage for offline Call Answer	1 to 99 hours (default 24 hours)			
Communities	15	15	NA	NA
Secondary extensions per mailbox	Unlimited			

1. A Supplementary Server that hosts Tracing Service, Offline Call Answer Store, or both does not count toward the maximum MAS units supported.
2. Customers can purchase additional mailboxes, for example, in increments of one, provided that system resources can support additional mailboxes.
3. Message Waiting Indicator (MWI), Call Me, and/or Notify Me usage each counts one toward the system limit, even if several features are used by the same subscriber. For example, one subscriber who also uses MWI and Call Me counts as 2 mailboxes toward the system limit.
4. No hard limit established for the product.
5. The maximum number of Caller Applications that are in use simultaneously is equal to the number of ports on an MAS. In a multiple MAS configuration, the number of simultaneously active Caller Applications is equal to the total number of ports in the Modular Messaging system.
6. A maximum of 150 Caller Applications can be deployed on a VMD with S3500 hardware and a maximum of 120 Caller Applications can be deployed on a VMD with S3400 hardware.
7. These values are administered and assigned to subscribers on a Class-of-Service (COS) basis and are not maximum values for a VMD. The maximum value for a VMD would depend on the values that are administered for all the COSs that will be assigned to subscribers and on the number of subscribers each COS is assigned to.
8. The maximum of 484 minutes cannot be achieved with all switch integrations (SWINs) or through all interfaces. Dialogic cards cannot keep a recording session open for longer than 109 minutes; thus resulting in a smaller maximum size when the TUIs are used with SWINs involving a Dialogic card.
9. Subject to storage limits.

Avaya Message Storage Server capacities

Avaya MSS

This section provides information about the capacities of an Avaya MSS, the standard-availability configuration (MSS—S), and the high-availability configuration (MSS—H).

Note:

Avaya does not control the capacities for single Microsoft Exchange and IBM Lotus Domino servers. Determine these capacities from Microsoft and IBM.

[Table 27](#) provides information about the capacities of an Avaya MSS with the S3500 and S3400 hardware.

Table 27: MSS capacities with the S3500 and S3400 hardware

Feature	S3500 hardware		S3400 hardware	
	MSS—S	MSS—H	MSS—S	MSS—H
Disk storage: number of disks @ size	2 @ 80 GB ¹	4 @ 72 GB ²	2 @ 80 GB ¹	3 @ 72 GB ³
Hours of storage ⁴ <ul style="list-style-type: none"> Using GSM 6.10 encoding Using G.711 encoding 	7,500 1,500	15,000 3,000	7,500 1,500	15,000 3,000
Subscriber mailboxes <ul style="list-style-type: none"> Maximum local subscribers Maximum remote networked subscribers, includes spoken names 	5,000 250,000	20,000 250,000	5,000 250,000	20,000 250,000
IMAP4 client sessions ⁵ <ul style="list-style-type: none"> Maximum number of clients, clients poll every 2 minutes These capacities exclude MAS IMAP4 (TUI session) use.	2,500	2,500	1,000	1,000
POP3 client sessions <ul style="list-style-type: none"> Maximum number of clients, clients poll every 2 minutes Maximum number of clients, clients poll every 10 minutes⁶ Maximum number of active client sessions 	2,500 5,000 80	2,500 5,000 80	1,000 2,000 24	1,000 2,000 24
Simple Message Transfer Protocol (SMTP) messages per hour, includes MAS-initiated deliveries	15,000	15,000	15,000	15,000

1. With software mirroring, two disks provide the actual storage capacity of only one disk.
2. With RAID Level 5, four disks provide the actual storage capacity of three disks.
3. With RAID Level 5, three disks provide the actual storage capacity of only two disks.
4. The MSS calculations account for the need to have at least 20% free space available for the system to run. System free space is built into these calculations for the MSS. Additional space is also reserved to support the storage of IMAP4 client data.
5. Some IMAP4 clients use two IMAP4 sessions per connection. For more information, see [IMAP4 client limits](#) on page 367.
6. More than 5,000 simultaneous sessions affects system performance.

Messaging application server capacities

[Table 28](#) provides information about the capacities of an MAS.

Table 28: MAS capacities

Feature	MAS capacity
Hours of storage ¹ <ul style="list-style-type: none"> Maximum for GSM 6.10 storage Maximum for G.711 storage 	5,000 hours 1,000 hours
Text-to-Speech (TTS) sessions <ul style="list-style-type: none"> English, using DECtalk Other languages, using RealSpeak TTS3000 All languages, using RealSpeak Telephony 3.5 <p>Note:</p> <p>The maximum number of TTS resources in a Modular Messaging—MSS VMD is two times the number of MAS units. Additional TTS resources cannot be purchased.</p>	12 12 12
Switch Link: High bandwidth for Q-Signaling (QSIG) integrations <ul style="list-style-type: none"> Maximum calls MWI updates 	15,000 per hour 15,000 per hour

1. Hours of storage for Call Answer messages are available only when the message store is unavailable. These values are estimated maximum values and are not guaranteed.

Modular Messaging—Message Storage Server

Avaya MSS

This section provides information about the port capacities of an MAS with a Modular Messaging—Message Storage Server (MSS) system. This information is applicable to a Modular Messaging—MSS system with mailboxes enabled for any or all of the Modular Messaging telephone user interfaces (TUIs).

S3500 hardware

[Table 29](#) provides information about the port capacities of a Modular Messaging—MSS system, where the MAS software resides on the S3500 hardware.

Table 29: MAS port capacities for Modular Messaging—MSS with the S3500 hardware

Integration	Cards	Voice			Fax			TTS ¹	
Integration type	Cards per MAS	Voice ports per card	Voice ports per MAS	Voice ports per VMD	Fax resources per card	Fax resources per MAS	Fax resources per VMD	Provided/maximum TTS per MAS	TTS per VMD
Session Initiation Protocol (SIP) ²	NA	NA	48	144	NA	48	144 ³	2/2	6
H.323-based IP ²	NA	NA	30	144	NA	NA	NA ³	2/2	10
T1 ⁴ QSIG	2	23	46	144 ⁵	4	8	40	2/2	8
E1 ⁴ QSIG	2	30	60	144 ⁵	4	8	40	2/2	6
Digital Set Emulation (DSE)	2	8	16	80	2	4	20	2/2	10
Analog ⁶ 12-port	2	12	24	120	4	8	40	2/2	10
Analog ⁶ 4-port ⁷	2	4	8	40	4	8	40	2/2	10

1. E-mail readers are purchased or included with the system and statically assigned to a specific MAS.

Modular Messaging system capacities

2. SIP and H.323 integration transmit voice as IP packets over the local area network (LAN) cards; thus separate port cards are not required.
3. SIP supports fax. All channels are available for inbound/outbound fax with SIP. H.323 does not support fax.
4. Avaya provides Dual-Span T1/E1 cards for incremental fax resources. The second span is not used for voice.
5. Not all ports are used on the last card.
6. Find Me is not supported for analog integrations.
7. Analog systems with four-port cards can be purchased as a new system in four-port and eight-port configurations only. Expansions after market are supported to capacity.

Overriding maximums

Overriding maximums for Modular Messaging—MSS with the S3500 hardware are:

- With MSS—S: two MAS units per VMD.
- With MSS—H: five MAS units per VMD.
- 144 ports per VMD.

Note:

A VMD can contain a mix of S3500 and S3400 servers, provided that the overriding maximum for the VMD is not exceeded and the maximums for each server type are respected.

S3400 hardware

This section provides information about the port capacities of a Modular Messaging—MSS system, where the MAS software resides on the S3400 hardware.

AUDIX or Serenade TUI for Modular Messaging

[Table 30](#) provides information about the MAS port capacities of a Modular Messaging—MSS system with mailboxes enabled for the following TUIs:

- Only the Modular Messaging AUDIX TUI
- Only the Modular Messaging Serenade TUI
- A combination of TUIs that includes the Modular Messaging Serenade TUI or the Modular Messaging AUDIX TUI

Systems that are initially configured with all Modular Messaging Aria TUI mailboxes that later deploy the Modular Messaging AUDIX TUI or Modular Messaging Serenade TUI must be engineered at that time to meet the capacities noted in [Table 30](#).

Table 30: MAS port capacities with the S3400 hardware (AUDIX or Serenade)

Integration	Cards	Voice			Fax			TTS ¹	
Integration type	Cards per MAS	Voice ports per card	Voice ports per MAS	Voice ports per VMD	Fax resources per card	Fax resources per MAS	Fax resources per VMD	Provided/maximum TTS per MAS	TTS per VMD
SIP ²	NA	NA	20	100	NA	20	100 ³	2/2	10
H.323-based IP ²	NA	NA	20	100	NA	NA	NA ³	2/2	10
T1 ⁴ QSIG	1	23	23	115	4	4	20	2/2	10
E1 ⁴ QSIG	1	30	30	144 ⁵	4	4	20	2/2	10
DSE	3	8	24	120	2	6	30	2/2	10
Analog ⁶ 12-port	2	12	24	120	4	8	40	2/2	10
Analog ⁶ 4-port ⁷	4	4	16	80	4	16	80	2/2	10

1. E-mail readers are purchased/included with the system, and statically assigned to a specific MAS.
2. SIP and H.323 integration transmit voice as IP packets over the LAN cards; thus separate port cards are not required.
3. SIP supports fax. All channels are available for inbound/outbound fax with SIP. H.323 does not support fax.
4. Avaya provides Dual-Span T1/E1 cards for incremental fax resources. The second span is not used for voice.
5. Not all ports are used on the last card.
6. Find Me is not supported for analog integrations.
7. Analog systems with four-port cards can be purchased as a new system in four-port and eight-port configurations only. Expansions after market are supported to capacity.

Aria TUI for Modular Messaging

[Table 31](#) provides information about the MAS port capacities of a Modular Messaging—MSS system with mailboxes enabled for the Modular Messaging Aria TUI.

Systems that are initially configured with all Modular Messaging Aria TUI mailboxes that later deploy the Modular Messaging AUDIX TUI or Modular Messaging Serenade TUI must be engineered at that time to meet the capacities noted in [Table 30](#).

Table 31: MAS port capacities with the S3400 hardware (Aria)

Integration	Cards	Voice			Fax			TTS ¹	
Integration type	Cards per MAS	Voice ports per card	Voice ports per MAS	Voice ports per VMD	Fax resources per card	Fax resources per MAS	Fax resources per VMD	Provided/maximum TTS per MAS	TTS per VMD
SIP ²	NA	NA	20	100	NA	20	100 ³	2/2	10
H.323-based IP ²	NA	NA	20	100	NA	NA	NA ³	2/2	10
T1 ⁴ QSIG	2	23	46	144 ⁵	4	8	40	2/2	8
E1 ⁴ QSIG	1	30	30	144 ⁵	4	4	20	2/2	10
DSE	4	8	32	144	2	8	40	2/2	10
Analog ⁶ 12-port	4	12	48	144	4	16	80	2/2	6
Analog ⁶ 4-port ⁷	4	4	16	80	4	16	80	2/2	10

1. E-mail readers are purchased/included with the system, and statically assigned to a specific MAS.

2. SIP and H.323 integration transmit voice as IP packets over the LAN cards; thus separate port cards are not required.

3. SIP supports fax. All channels are available for inbound/outbound fax with SIP. H.323 does not support fax.

4. Avaya provides Dual-Span T1/E1 cards for incremental fax resources. The second span is not used for voice.

5. Not all ports are used on the last card.

6. Find Me is not supported for analog integrations.

7. Analog systems with four-port cards can be purchased as a new system in four-port and eight-port configurations only. Expansions after market are supported to capacity.

Overriding maximums

Overriding maximums for Modular Messaging—MSS with the S3400 hardware are:

- With MSS—S: two MAS units per VMD.
- With MSS—H: five MAS units per VMD.
- 144 ports per VMD.

Modular Messaging—Microsoft Exchange

Microsoft Exchange

This section provides information about the port capacities of an MAS with a Modular Messaging—Microsoft Exchange system. This information is applicable to a Modular Messaging—Microsoft Exchange system with mailboxes enabled for any or all of the Modular Messaging TUIs.

S3500 hardware

[Table 32](#) provides information about the port capacities of a Modular Messaging—Microsoft Exchange system, where the MAS software resides on the S3500 hardware.

Table 32: MAS port capacities for Modular Messaging—Exchange with the S3500 hardware

Integration	Cards	Voice			TTS ¹	
Integration type	Cards per MAS	Voice ports per card	Voice ports per MAS	Voice ports per VMD	Provided/maximum TTS per MAS	TTS per VMD
SIP ²	NA	NA	48	240	2/12	60
H.323-based IP ²	NA	NA	30	240	2/12	96
T1 ³ QSIG	2	23	46	230	2/12	60
E1 ³ QSIG	2	30	60	240	2/12	48
DSE	2	8	16	160	2/12	120
Analog ⁴ 12-port	2	12	24	240	2/12	120
Analog ⁴ 4-port ⁵	2	4	8	40	2/12	60

1. E-mail readers are purchased or included with the system and statically assigned to a specific MAS.

2. SIP and H.323 integration transmit voice as IP packets over the LAN cards; thus separate port cards are not required.

3. Avaya provides Dual-Span T1/E1 cards for incremental fax resources. The second span is not used for voice.
4. Find Me is not supported for analog integrations.
5. Analog systems with four-port cards can be purchased as a new system in four-port and eight-port configurations only. Expansions after market are supported to capacity.

Note:

Fax capabilities are provided by a third-party fax server. The maximum number of fax ports supported for a VMD is dependent upon the fax server.

Overriding maximums

Overriding maximums for Modular Messaging—Exchange with the S3500 hardware are:

- 10 MAS units per VMD.
- 240 ports per VMD.

Note:

A VMD can contain a mix of S3500 and S3400 servers, provided that the overriding maximum for the VMD is not exceeded and the maximums for each server type are respected.

MAS port capacities in a software-only configuration

[Table 33](#) provides information about the port capacities of a Modular Messaging—Microsoft Exchange, Release 3 system in a software-only configuration.

In a software-only configuration, the customer provides the hardware for the MAS server and Avaya provides the MAS software.

Table 33: MAS port capacities for Modular Messaging—Exchange in a software-only configuration

Integration type	Cards	Voice			TTS ¹	
		Voice ports per card	Voice ports per MAS	Voice ports per VMD	Provided/maximum TTS per MAS	TTS per VMD
SIP ²	NA	NA	48	240	2/12	60
H.323-based IP ²	NA	NA	30	240	2/12	96
T1 ³ QSIG	2	23	46	230	2/12	60
E1 ³ QSIG	2	30	60	240	2/12	48
DSE	4	8	32	240	2/12	96
Analog ⁴ 12-port	4	12	48	240	2/12	60
Analog ⁴ 4-port ⁵	4	4	16	80	2/12	60

1. E-mail readers are purchased or included with the system and statically assigned to a specific MAS.

2. SIP and H.323 integration transmit voice as IP packets over the LAN cards; thus separate port cards are not required.

3. Avaya provides Dual-Span T1/E1 cards for incremental fax resources. The second span is not used for voice.

4. Find Me is not supported for analog integrations.

5. Analog systems with four-port cards can be purchased as a new system in four-port and eight-port configurations only. Expansions after market are supported to capacity.

Note:

Fax capabilities are provided by a third-party fax server. The maximum number of fax ports supported for a VMD is dependent upon the fax server.

S3400 hardware

This section provides information about the port capacities of a Modular Messaging—Microsoft Exchange system, where the MAS software resides on the S3400 hardware.

AUDIX or Serenade TUI for Modular Messaging

[Table 34](#) provides information about the MAS port capacities of a Modular Messaging—Exchange system with mailboxes enabled for the following TUIs:

- Only the Modular Messaging AUDIX TUI
- Only the Modular Messaging Serenade TUI
- A combination of TUIs that includes the Modular Messaging Serenade TUI or the Modular Messaging AUDIX TUI

Systems that are initially configured with all Modular Messaging Aria TUI mailboxes that later deploy the Modular Messaging AUDIX TUI or Modular Messaging Serenade TUI must be engineered at that time to meet the capacities noted in [Table 34](#).

Table 34: MAS port capacities with the S3400 hardware (AUDIX or Serenade)

Integration	Cards	Voice			TTS ¹	
Integration type	Cards per MAS	Voice ports per card	Voice ports per MAS	Voice ports per VMD	Provided/maximum TTS per MAS	TTS per VMD
SIP ²	NA	NA	20	200	2/12	120
H.323-based IP ²	NA	NA	20	200	2/12	120
T1 ³ QSIG	1	23	23	230	2/12	120
E1 ³ QSIG	1	30	30	240	2/12	96
DSE	3	8	24	240	2/12	120
Analog ⁴ 12-port	2	12	24	240	2/12	120
Analog ⁴ 4-port ⁵	4	4	16	80	2/12	60

1. E-mail readers are purchased or included with the system and statically assigned to a specific MAS.

2. SIP and H.323 integration transmit voice as IP packets over the LAN cards; thus separate port cards are not required.
3. Avaya provides Dual-Span T1/E1 cards for incremental fax resources. The second span is not used for voice.
4. Find Me is not supported for analog integrations.
5. Analog systems with four-port cards can be purchased as a new system in four-port and eight-port configurations only. Expansions after market are supported to capacity.

Note:

Fax capabilities are provided by a third-party fax server. The maximum number of fax ports supported for a VMD is dependent upon the fax server.

Aria TUI for Modular Messaging

[Table 35](#) provides information about the MAS port capacities of a Modular Messaging—Exchange system with mailboxes enabled for the Modular Messaging Aria TUI.

Systems that are initially configured with all Modular Messaging Aria TUI mailboxes that later deploy the Modular Messaging AUDIX TUI or Modular Messaging Serenade TUI must be engineered at that time to meet the capacities noted in [Table 34](#).

Table 35: MAS port capacities with the S3400 hardware (Aria)

Integration	Cards		Voice		TTS ¹	
Integration type	Cards per MAS	Voice ports per card	Voice ports per MAS	Voice ports per VMD	Provided/maximum TTS per MAS	TTS per VMD
SIP ²	NA	NA	20	200	2/12	120
H.323-based IP ²	NA	NA	20	200	2/12	120
T1 ³ QSIG	2	23	46	230	2/12	60
E1 ³ QSIG	1	30	30	240	2/12	96
DSE	4	8	32	240	2/12	96
Analog ⁴ 12-port	4	12	48	240	2/12	60
Analog ⁴ 4-port ⁵	4	4	16	80	2/12	60

1. E-mail readers are purchased or included with the system and statically assigned to a specific MAS.

2. SIP and H.323 integration transmit voice as IP packets over the LAN cards; thus separate port cards are not required.

3. Avaya provides Dual-Span T1/E1 cards for incremental fax resources. The second span is not used for voice.

4. Find Me is not supported for analog integrations.

5. Analog systems with four-port cards can be purchased as a new system in four-port and eight-port configurations only. Expansions after market are supported to capacity.

Note:

Fax capabilities are provided by a third-party fax server. The maximum number of fax ports supported for a VMD is dependent upon the fax server.

Overriding maximums

Overriding maximums for Modular Messaging—Exchange with the S3400 hardware are:

- 10 MAS units per VMD
- 240 ports per VMD

Modular Messaging—IBM Lotus Domino

IBM Lotus Domino

This section provides information about the port capacities of an MAS with a Modular Messaging—IBM Lotus Domino system. This information is applicable to a Modular Messaging—IBM Lotus Domino system with mailboxes enabled for any or all of the Modular Messaging TUIs.

S3500 hardware

[Table 36](#) provides information about the port capacities of a Modular Messaging—IBM Lotus Domino system, where the MAS software resides on the S3500 hardware.

Table 36: MAS port capacities for Modular Messaging—Domino with the S3500 hardware

Integration	Cards	Voice			TTS ¹	
Integration type	Cards per MAS	Voice ports per card	Voice ports per MAS	Voice ports per VMD	Provided/maximum TTS per MAS	TTS per VMD
SIP ²	NA	NA	48	240	2/12	60
H.323-based IP ²	NA	NA	30	240	2/12	96
T1 ³ QSIG	2	23	46	230	2/12	60
E1 ³ QSIG	2	30	60	240	2/12	48
DSE	2	8	16	160	2/12	120
Analog ⁴ 12-port	2	12	24	240	2/12	120
Analog ⁴ 4-port ⁵	2	4	8	40	2/12	60

1. E-mail readers are purchased or included with the system and statically assigned to a specific MAS.

2. SIP and H.323 integration transmit voice as IP packets over the LAN cards; thus separate port cards are not required.
3. Avaya provides Dual-Span T1/E1 cards for incremental fax resources. The second span is not used for voice.
4. Find Me is not supported for analog integrations.
5. Analog systems with four-port cards can be purchased as a new system in four-port and eight-port configurations only. Expansions after market are supported to capacity.

Note:

Fax capabilities are provided by a third-party fax server. The maximum number of fax ports supported for a VMD is dependent upon the fax server.

Overriding maximums

The overriding maximums for Modular Messaging—Domino with the S3500 hardware are:

- 10 MAS units per VMD.
- 240 ports per VMD.

MAS port capacities in a software-only configuration

[Table 37](#) provides information about the port capacities of a Modular Messaging—IBM Lotus Domino system in a software-only configuration. In a software-only configuration, the customer provides the hardware for the MAS server and Avaya provides the MAS software.

Table 37: MAS port capacities for Modular Messaging—Domino in a software-only configuration

Integration	Cards	Voice			TTS ¹	
Integration type	Cards per MAS	Voice ports per card	Voice ports per MAS	Voice ports per VMD	Provided/maximum TTS per MAS	TTS per VMD
SIP ²	NA	NA	48	240	2/12	60
H.323-based IP ²	NA	NA	30	240	2/12	96
T1 ³ QSIG	2	23	46	230	2/12	60
E1 ³ QSIG	2	30	60	240	2/12	48
DSE	4	8	32	240	2/12	96
Analog ⁴ 12-port	4	12	48	240	2/12	60
Analog ⁴ 4-port ⁵	4	4	16	80	2/12	60

1. E-mail readers are purchased or included with the system and statically assigned to a specific MAS.

2. SIP and H.323 integration transmit voice as IP packets over the LAN cards; thus separate port cards are not required.

3. Avaya provides Dual-Span T1/E1 cards for incremental fax resources. The second span is not used for voice.

4. Find Me is not supported for analog integrations.

5. Analog systems with four-port cards can be purchased as a new system in four-port and eight-port configurations only. Expansions after market are supported to capacity.

Note:

Fax capabilities are provided by a third-party fax server. The maximum number of fax ports supported for a VMD is dependent upon the fax server.

Chapter 12: Port Sizing

Based on the results of a detailed system study, Avaya has developed port sizing recommendations to assist planners in the port sizing exercise. This chapter explains how planners can make use of the Avaya Modular Messaging recommendations.

This chapter also provides information about analyzing port sizing requirements without the aid of the Modular Messaging recommendations.

This chapter contains the following topics:

- [Port sizing using Modular Messaging recommendations](#) on page 276
- [Recommendations for Modular Messaging—MSS](#) on page 278
- [Recommendations for Modular Messaging—Exchange](#) on page 291
- [Recommendations for Modular Messaging—Domino](#) on page 320
- [Port sizing without using Modular Messaging recommendations](#) on page 337

Note:

To validate planning assumptions, use Modular Messaging reports, such as:

- Hourly Statistics
- Port Statistics
- Feature Daily or Hourly Traffic Report
- Load Daily or Hourly Traffic Report
- Network Load Daily or Hourly Traffic Report
- Remote Message Daily or Monthly Traffic Report
- Subscriber Daily or Monthly Traffic Report

For more information about reports, see [MAS and MSS reports](#) on page 459.

Port sizing using Modular Messaging recommendations

When sizing port requirements, planners must be able to estimate the following:

- Number of subscribers in a voice mail domain (VMD)
- Number of ports required to support the estimated number of subscribers
- Number of messaging application server (MAS) units required to provide that number of ports
- Number of e-mail readers required to provide text-to-speech (TTS) capabilities for the estimated number of subscribers

To simplify the planning process, Avaya has designed recommendations that have precalculated estimations of the number of ports and MAS units required for a given number of subscribers. In addition, the recommendations provide an estimate of additional e-mail readers.



Important:

The Modular Messaging recommendations eliminate the need to calculate port requirements, the number of MAS units required, and the number of port boards required.

Planners that want to perform a more detailed study of the port requirements can refer to [Port sizing without using Modular Messaging recommendations](#) on page 337. However, those instructions are meant only for planners with sufficient prior experience in implementing a messaging system.

Port usage patterns

When planning a system, planners must make an accurate estimate of the number of ports required to provide services to a given number of subscribers.

The Modular Messaging recommendations provide precalculated estimates of the required number of ports. However, a planner benefits from understanding how the port usage patterns of subscribers affect the estimation of port capacity.

Modular Messaging—MSS

Avaya MSS

Modular Messaging—MSS subscribers often use the system for voice and fax messaging. A separate, customer-provided system is used for e-mail messages.

Subscribers use the system primarily for retrieval of voice and fax messages by means of a telephone; thus port usage is high. Subscribers that want to have corporate e-mails read to them over the telephone can use the Unified Communication Center (UCC) Speech Access

client. When subscribers access messages through UCC Speech Access, they are not using Modular Messaging ports; thus port usage decreases on the Modular Messaging system.

The Modular Messaging—MSS system is intended for traditional port usage, with 6 minutes of voice messaging per day per subscriber.

Port usage consists primarily of Call Answer sessions and message retrieval using the telephone user interfaces (TUIs). A small amount of port usage is available for features such as, Call Me, Find Me, Message Waiting Indicator (MWI), Automated Attendants, Caller Applications, and Fax Sender Service.

Modular Messaging—Exchange and Modular Messaging—Domino

Microsoft Exchange

IBM Lotus Domino

Subscribers of Modular Messaging—Microsoft Exchange and Modular Messaging—IBM Lotus Domino use the system for voice, fax, and e-mail messaging.

Note:

A customer-provided third-party fax server provides fax capabilities.

Usually, subscribers use graphical user interface (GUI) clients for messaging; thus port usage is lower, with 4.5 minutes of messaging per day per subscriber. This includes TTS conversion of e-mail messages.

The connect time for mobile subscribers increases because of access to e-mail messages. However, the connect time for desktop users decreases relative to traditional voice mail because of accessing messages over the LAN. The net effect is lower port usage per user.

Port usage consists primarily of Call Answer sessions. A significant portion of retrieval time using the voice ports is for TTS of e-mail messages.

Recommendations for Modular Messaging—MSS

Avaya MSS

Consider the following items before referring to the recommendations:

- The Modular Messaging—MSS system is intended for traditional port usage, with 6 minutes of voice messaging per day per subscriber.
- The recommendations indicate the maximum number of subscribers supported by the given port configuration. When provisioning a new system, allow for growth. If the initial number of subscribers is within 5% to 15% of the maximum, Avaya recommends the next size system.
- The recommendations provide for traffic patterns of 14% busy-hour traffic.

Note:

If callers and subscribers are spread across multiple time zones, port usage might be spread across time zones. In such cases, the traffic is during the busy hour might be less than 14%.

- The recommendations are applicable to switch integrations (SWINs) that support queuing and to switches that do not support queuing. SWINs that support queuing allow calls to be queued on the switch until a port is available on the Modular Messaging system. SWINs that do not support queuing cause callers to hear a busy signal when no ports are available on the Modular Messaging system.

The recommendations reflect both nonqueuing and queuing sizing recommendations. Nonqueuing sizing recommendations use the Erlang B model and P.02 Grade of Service (GOS). Queuing sizing recommendations use the Erlang C model and P.05 GOS. Currently, most Modular Messaging SWINs do not support switch queuing. For example, the Avaya Communication Manager implementation with Q.Signaling (QSIG) integration does not support queuing.

- Avaya recommends DSE integration with Avaya or Siemens PBXs for new Modular Messaging systems only if the system contains 500 mailboxes or less than 500 mailboxes.
- These recommendations are based on the assumption that the system is used primarily for voice and fax messaging. This version does not support TUI access to corporate e-mail messages stored on a separate e-mail server.
- These recommendations are based on the assumption that 10% of the subscribers use fax messaging regularly, with 0.75 three-page faxes per day per subscriber.
- The number of subscriber mailboxes is rounded to the nearest hundred.

Recommendations with Avaya S3500 MAS units

This section provides information about the port sizing recommendations for Modular Messaging—MSS systems with Avaya S3500 MAS units.

SIP integration

[Table 38](#) provides information about the Session Initiation Protocol (SIP) integration recommendation for Modular Messaging—MSS with Avaya S3500 MAS units.

Table 38: SIP integration recommendation (Avaya S3500 MAS)

Subscriber mailboxes	Voice ports	MAS units
2,500	48	1
Larger systems require an MSS—H message store.		
5,500	96	2
8,600	144	3
Larger systems require a Supplementary Server.		

H.323 integration

[Table 39](#) provides information about the H.323 integration recommendation for Modular Messaging—MSS with Avaya S3500 MAS units.

Table 39: H.323 integration recommendation (Avaya S3500 MAS)

Subscriber mailboxes	Voice ports	MAS units
1,400	30	1
3,300	60	2
Larger systems require an MSS—H message store.		
5,100	90	3
Larger systems require a Supplementary Server.		
7,100	120	4
8,600	144	5

T1 QSIG integration

[Table 40](#) provides information about the T1 QSIG integration recommendation for Modular Messaging—MSS with Avaya S3500 MAS units.

Table 40: T1 QSIG integration recommendation (Avaya S3500 MAS)

Subscriber mailboxes	Voice ports	Fax ports	23-port T1 boards	MAS units
1,000	23	4	1	1
2,400	46	8	2	1
Larger systems require an MSS—H message store.				
3,800	69	12	3	2
5,300	92	16	4	2
6,700	115	20	5	3
8,200	138	24	6	3
Larger systems require a Supplementary Server.				
8,600	144	28	7	4

E1 QSIG integration

[Table 41](#) provides information about the E1 QSIG integration recommendation for Modular Messaging—MSS with Avaya S3500 MAS units.

Table 41: E1 QSIG integration recommendation (Avaya S3500 MAS)

Subscriber mailboxes	Voice ports	Fax ports	30-port E1 boards	MAS units
1,400	30	4	1	1
3,300	60	8	2	1
Larger systems require an MSS—H message store.				
5,100	90	12	3	2
7,100	120	16	4	2
Larger systems require a Supplementary Server.				
8,600	144	20	5	3

Digital Set Emulation integration

[Table 42](#) provides information about the Digital Set Emulation (DSE) integration recommendation for Modular Messaging—MSS with Avaya S3500 MAS units.

Table 42: DSE integration recommendation (Avaya S3500 MAS)

Subscriber mailboxes	Voice ports	Fax ports	8-port DSE boards	MAS units
200	8	2	1	1
600	16	4	2	1
1,100	24	6	3	2
1,600	32	8	4	2
2,000	40	10	5	3
2,500	48	12	6	3
3,000	56	14	7	4
3,500	64	16	8	4
Larger systems require an MSS—H message store.				
4,000	72	18	9	5
4,500	80	20	10	5

Analog integration (12-port board)

[Table 43](#) provides information about the analog integration (12-port board) recommendation for Modular Messaging—MSS with Avaya S3500 MAS units.

Table 43: Analog integration (12-port board) recommendation (Avaya S3500 MAS)

Subscriber mailboxes	Voice ports	Fax ports	12-port boards	MAS units
400	12	4	1	1
1,100	24	8	2	1
1,800	36	12	3	2
2,500	48	16	4	2
Larger systems require an MSS—H message store.				
3,300	60	20	5	3
4,000	72	24	6	3
4,800	84	28	7	4
5,500	96	32	8	4
6,300	108	36	9	5
7,100	120	40	10	5

Analog integration (4-port board)

[Table 44](#) provides information about the analog integration (4-port board) recommendation for Modular Messaging—MSS with Avaya S3500 MAS units.

Table 44: Analog integration (4-port board) recommendation (Avaya S3500 MAS)

Subscriber mailboxes	Voice ports	Fax ports	4-port boards	MAS units
70	4	4	1	1
200	8	8	2	1

Note:

Analog systems with 4-port cards can be purchased as a new system in 4-port and 8-port configurations only. For larger systems, use configurations with 12-port analog cards.

Recommendations with Avaya S3400 MAS units

The port sizing recommendations for Modular Messaging—MSS with Avaya S3400 MAS units depend on the TUI in use.

Modular Messaging Aria TUI recommendations

These recommendations are applicable to systems with all subscriber mailboxes enabled only for the Modular Messaging Aria TUI.

SIP integration

[Table 45](#) provides information about the SIP integration recommendation for Modular Messaging—MSS with Avaya S3400 MAS units (Aria TUI only).

Table 45: SIP integration recommendation (Avaya S3400 MAS, Aria TUI only)

Subscriber mailboxes	Voice ports	MAS units
900	20	1
2,000	40	2
3,300	60	3
Larger systems require an MSS—H message store and a Supplementary Server.		
4,500	80	4
5,800	100	5

H.323 integration

[Table 46](#) provides information about the H.323 integration recommendation for Modular Messaging—MSS with Avaya S3400 MAS units (Aria TUI only).

Table 46: H.323 integration recommendation (Avaya S3400 MAS, Aria TUI only)

Subscriber mailboxes	Voice ports	MAS units
900	20	1
2,000	40	2
3,300	60	3
Larger systems require an MSS—H message store and a Supplementary Server.		

Port Sizing

Table 46: H.323 integration recommendation (Avaya S3400 MAS, Aria TUI only)

4,500	80	4
5,800	100	5

T1 QSIG integration

[Table 47](#) provides information about the T1 QSIG integration recommendation for Modular Messaging—MSS with Avaya S3400 MAS units (Aria TUI only).

Table 47: T1 QSIG integration recommendation (Avaya S3400 MAS, Aria TUI only)

Subscriber mailboxes	Voice ports	Fax ports	23-port T1 boards	MAS units
1,000	23	4	1	1
2,400	46	8	2	1
Larger systems require an MSS—H message store.				
3,800	69	12	3	2
5,300	92	16	4	2
6,700	115	20	5	3
8,200	138	24	6	3
Larger systems require a Supplementary Server.				
8,600	144	28	7	4

E1 QSIG integration

[Table 48](#) provides information about the E1 QSIG integration recommendation for Modular Messaging—MSS with Avaya S3400 MAS units (Aria TUI only).

Table 48: E1 QSIG integration recommendation (Avaya S3400 MAS, Aria TUI only)

Subscriber mailboxes	Voice ports	Fax ports	30-port E1 boards	MAS units
1,400	30	4	1	1
3,300	60	8	2	2
Larger systems require an MSS—H message store.				
5,100	90	12	3	3
Larger systems require a Supplementary Server.				

Table 48: E1 QSIG integration recommendation (Avaya S3400 MAS, Aria TUI only)

7,100	120	16	4	4
8,600	144	20	5	5

Digital Set Emulation integration

[Table 49](#) provides information about the DSE integration recommendation for Modular Messaging—MSS with Avaya S3400 MAS units (Aria TUI only).

Table 49: DSE integration recommendation (Avaya S3400 MAS, Aria TUI only)

Subscriber mailboxes	Voice ports	Fax ports	8-port DSE boards	MAS units
2,00	8	2	1	1
6,00	16	4	2	1
1,100	24	6	3	1
1,600	32	8	4	1
2,000	40	10	5	2
2,500	48	12	6	2
3,000	56	14	7	2
3,500	64	16	8	2
Larger systems require an MSS—H message store.				
4,000	72	18	9	3
4,500	80	20	10	3
5,000	88	22	11	3
5,500	96	24	12	3
Larger systems require a Supplementary Server.				
6,000	104	26	13	4
6,500	112	28	14	4
7,100	120	30	15	4
7,600	128	32	16	4
8,100	136	34	17	5
8,600	144	36	18	5

Port Sizing

Analog integration (12-port board)

[Table 50](#) provides information about the analog integration (12-port board) recommendation for Modular Messaging—MSS with Avaya S3400 MAS units (Aria TUI only).

Table 50: 12-port analog integration recommendation (Avaya S3400 MAS, Aria TUI only)

Subscriber mailboxes	Voice ports	Fax ports	12-port boards	MAS units
400	12	4	1	1
1,100	24	8	2	1
1,800	36	12	3	1
2,500	48	16	4	1
Larger systems require an MSS—H message store.				
3,300	60	20	5	2
4,000	72	24	6	2
4,800	84	28	7	2
5,500	96	32	8	2
6,300	108	36	9	3
7,100	120	40	10	3
7,800	132	44	11	3
8,600	144	48	12	3

Analog integration (4-port board)

[Table 51](#) provides information about the analog integration (4-port board) recommendation for Modular Messaging—MSS with Avaya S3400 MAS units (Aria TUI only).

Table 51: Analog integration (4-port board) recommendation (Avaya S3400 MAS, Aria TUI only)

Subscriber mailboxes	Voice ports	Fax ports	4-port boards	MAS units
70	4	4	1	1
200	8	8	2	1

Note:

Analog systems with 4-port cards can be purchased as a new system in 4-port and 8-port configurations only. For larger systems, use configurations with 12-port analog cards.

Modular Messaging AUDIX TUI or Serenade TUI recommendations

These port sizing recommendations are applicable to systems with subscriber mailboxes enabled for the Modular Messaging AUDIX TUI, Modular Messaging Serenade TUI, or a combination of any of the Modular Messaging TUIs.

SIP integration

[Table 52](#) provides information about the SIP integration recommendation for Modular Messaging—MSS with Avaya S3400 MAS units (AUDIX TUI or Serenade TUI).

Table 52: SIP integration recommendation (Avaya S3400 MAS, AUDIX or Serenade TUI)

Subscriber mailboxes	Voice ports	MAS units
900	20	1
2,000	40	2
3,300	60	3
Larger systems require an MSS—H message store and a Supplementary Server.		
4,500	80	4
5,800	100	5

H.323 integration

[Table 53](#) provides information about the H.323 integration recommendation for Modular Messaging—MSS with Avaya S3400 MAS units (AUDIX TUI or Serenade TUI).

Table 53: H.323 integration recommendation (Avaya S3400 MAS, AUDIX or Serenade TUI)

Subscriber mailboxes	Voice ports	MAS units
900	20	1
2,000	40	2
3,300	60	3
Larger systems require an MSS—H message store and a Supplementary Server.		
4,500	80	4
5,800	100	5

T1 QSIG integration

[Table 54](#) provides information about the T1 QSIG integration recommendation for Modular Messaging—MSS with Avaya S3400 MAS units (AUDIX TUI or Serenade TUI).

Table 54: T1 QSIG integration recommendation (Avaya S3400 MAS, AUDIX or Serenade TUI)

Subscriber mailboxes	Voice ports	Fax ports	23-port T1 boards	MAS units
1,000	23	15	1	1
2,400	46	30	2	2
3,800	69	45	3	3
Larger systems require an MSS—H message store and a Supplementary Server.				
5,300	92	60	4	4
6,700	115	75	5	5

E1 QSIG integration

[Table 55](#) provides information about the E1 QSIG integration recommendation for Modular Messaging—MSS with Avaya S3400 MAS units (AUDIX TUI or Serenade TUI).

Table 55: E1 QSIG integration recommendation (Avaya S3400 MAS, AUDIX or Serenade TUI)

Subscriber mailboxes	Voice ports	Fax ports	30-port E1 boards	MAS units
1,400	30	16	1	1
3,300	60	32	2	2
Larger systems require an MSS—H message store.				
5,100	90	48	3	3
Larger systems require a Supplementary Server.				
7,100	120	64	4	4
8,600	144	80	5	5

Digital Set Emulation integration

[Table 56](#) provides information about the DSE integration recommendation for Modular Messaging—MSS with Avaya S3400 MAS units (AUDIX TUI or Serenade TUI).

Table 56: DSE integration recommendation (Avaya S3400 MAS, AUDIX or Serenade TUI)

Subscriber mailboxes	Voice ports	Fax ports	8-port DSE boards	MAS units
200	8	2	1	1
600	16	4	2	1
1,100	24	6	3	1
1,600	32	8	4	2
2,000	40	10	5	2
2,500	48	12	6	2
Larger systems require an MSS—H message store.				
3,000	56	14	7	3
3,500	64	16	8	3
4,000	72	18	9	3
Larger systems require a Supplementary Server.				
4,500	80	20	10	4
5,000	88	22	11	4
5,500	96	24	12	4
6,000	104	26	13	5
6,500	112	28	14	5
7,100	120	30	15	5

Analog integration (12-port board)

[Table 57](#) provides information about the analog integration (12-port board) recommendation for Modular Messaging—MSS with Avaya S3400 MAS units (AUDIX TUI or Serenade TUI).

Table 57: Analog integration (12-port board) recommendation (Avaya S3400 MAS, AUDIX or Serenade TUI)

Subscriber mailboxes	Voice ports	Fax ports	12-port boards	MAS units
400	12	4	1	1
1,100	24	8	2	1
1,800	36	12	3	2
2,500	48	16	4	2
Larger systems require an MSS—H message store.				
3,300	60	20	5	3
4,000	72	24	6	3
Larger systems require a Supplementary Server.				
4,800	84	28	7	4
5,500	96	32	8	4
6,300	108	36	9	5
7,100	120	40	10	5

Analog integration (4-port board)

[Table 58](#) provides information about the analog integration (4-port board) recommendation for Modular Messaging—MSS with Avaya S3400 MAS units (AUDIX TUI or Serenade TUI).

Table 58: Analog integration (4-port board) recommendation (Avaya S3400 MAS, AUDIX or Serenade TUI)

Subscriber mailboxes	Voice ports	Fax ports	4-port boards	MAS units
70	4	4	1	1
200	8	8	2	1

Note:

Analog systems with 4-port cards can be purchased as a new system in 4-port and 8-port configurations only. For larger systems, use configurations with 12-port analog cards.

Recommendations for Modular Messaging—Exchange

Microsoft Exchange

Consider the following items before referring to the recommendations:

- Usually, subscribers use GUI clients for messaging; therefore, port usage is lower, with 4.5 minutes of messaging per day per subscriber. This includes TTS conversion of corporate e-mail messages.
- These recommendations provide for traffic patterns of 14% busy-hour traffic.
- These recommendations are applicable to SWINs that support queuing and to switches that do not support queuing. SWINs that support queuing allow calls to be queued on the switch until a port is available on the Modular Messaging system. SWINs that do not support queuing cause callers to hear a busy signal when no ports are available on the Modular Messaging system.

The recommendations reflect both nonqueuing and queuing sizing recommendations. Nonqueuing sizing recommendations use the Erlang B model and P.02 GOS. Queuing sizing recommendations use the Erlang C model and P.05 GOS. Currently, most Modular Messaging SWINs do not support switch queuing. For example, the Avaya Communication Manager QSIG integration implementation does not support queuing.

- Avaya recommends DSE integration with Avaya or Siemens PBXs for new Modular Messaging systems only if the system contains 500 mailboxes or less than 500 mailboxes.
- Calculations are based on the assumption that the system is used for all messaging types, including voice, fax, and e-mail.
- The number of subscriber mailboxes is rounded to the nearest hundred.

Recommendations with Avaya S3500 MAS units

This section provides information about the port sizing recommendations for Modular Messaging—Exchange systems with Avaya S3500 MAS units.

SIP integration

[Table 59](#) provides information about the SIP integration recommendation for Modular Messaging—Exchange with Avaya S3500 MAS units.

Table 59: SIP integration recommendation (S3500 MAS)

Subscriber mailboxes	Voice ports	E-mail readers recommended (Included)	MAS units
3,400	48	5 (2)	1
7,400	96	10 (4)	2
11,500	144	15 (6)	3
Larger systems require a Supplementary Server.			
15,600	192	20 (8)	4
19,700	240	25 (10)	5

H.323 integration

[Table 60](#) provides information about the H.323 integration recommendation for Modular Messaging—Exchange with Avaya S3500 MAS units.

Table 60: H.323 integration recommendation (S3500 MAS)

Subscriber mailboxes	Voice ports	E-mail readers recommended (Included)	MAS units
1,900	30	4 (2)	1
4,300	60	8 (4)	2
6,900	90	12 (6)	3
Larger systems require a Supplementary Server.			
9,400	120	16 (8)	4
11,500	144	20 (10)	5
12,000	150	20 (10)	5

Table 60: H.323 integration recommendation (S3500 MAS)

14,500	180	24 (12)	6
17,100	210	28 (14)	7
19,700	240	32 (16)	8

T1 QSIG integration

[Table 61](#) provides information about the T1 QSIG integration recommendation for Modular Messaging—Exchange with Avaya S3500 MAS units.

Table 61: T1 QSIG integration recommendation (S3500 MAS)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	23-port T1 boards	MAS units
1,400	23	15	3 (2)	1	1
3,200	46	30	5 (2)	2	1
5,100	69	45	8 (4)	3	2
7,000	92	60	10 (4)	4	2
9,000	115	75	13 (6)	5	3
11,000	138	90	15 (6)	6	3
Larger systems require a Supplementary Server.					
11,500	144	96	18 (8)	7	4
12,900	161	105	18 (8)	7	4
14,900	184	120	20 (8)	8	4
16,800	207	135	23 (10)	9	5
18,800	230	150	25 (10)	10	5

E1 QSIG integration

[Table 62](#) provides information about the E1 QSIG integration recommendation for Modular Messaging—Exchange with Avaya S3500 MAS units.

Table 62: E1 QSIG integration recommendation (S3500 MAS)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	30-port E1 boards	MAS units
1,900	30	16	4 (2)	1	1
4,300	60	32	5 (2)	2	1
6,900	90	48	9 (4)	3	2
9,400	120	64	10 (4)	4	2
Larger systems require a Supplementary Server.					
11,500	144	80	14 (6)	5	3
12,000	150	80	14 (6)	5	3
14,500	180	96	15 (6)	6	3
17,100	210	112	19 (8)	7	4
19,700	240	128	20 (8)	8	4

Digital Set Emulation integration

[Table 63](#) provides information about the DSE integration recommendation for Modular Messaging—Exchange with Avaya S3500 MAS units.

Table 63: DSE integration recommendation (S3500 MAS)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	8-port DSE boards	MAS units
300	8	2	2 (2)	1	1
900	16	4	3 (2)	2	1
1,500	24	6	5 (4)	3	2
2,100	32	8	6 (4)	4	2
2,700	40	10	8 (6)	5	3
3,400	48	12	9 (6)	6	3
4,000	56	14	11 (8)	7	4
4,700	64	16	12 (8)	8	4
5,300	72	18	14 (10)	9	5
6,000	80	20	15 (10)	10	5
6,700	88	22	17 (12)	11	6
7,400	96	24	18 (12)	12	6
8,000	104	26	20 (14)	13	7
8,700	112	28	21 (14)	14	7
9,400	120	30	23 (16)	15	8
10,100	128	32	24 (16)	16	8
10,800	136	34	26 (18)	17	9
11,500	144	36	27 (18)	18	9
12,100	152	38	29 (20)	19	10
12,800	160	40	30 (20)	20	10

Analog integration (12-port board)

[Table 64](#) provides information about the analog integration (12-port board) recommendation for Modular Messaging—Exchange with Avaya S3500 MAS units.

Table 64: Analog integration (12-port board) recommendation (S3500 MAS)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	12-port boards	MAS units
600	12	4	3 (2)	1	1
1,500	24	8	3 (2)	2	1
2,400	36	12	6 (4)	3	2
3,400	48	16	6 (4)	4	2
4,300	60	20	9 (6)	5	3
5,300	72	24	9 (6)	6	3
6,400	84	28	12 (8)	7	4
7,400	96	32	12 (8)	8	4
8,400	108	36	15 (10)	9	5
9,400	120	40	15 (10)	10	5
10,400	132	44	18 (12)	11	6
11,500	144	48	18 (12)	12	6
12,500	156	52	21 (14)	13	7
13,500	168	56	21 (14)	14	7
14,500	180	60	24 (16)	15	8
15,600	192	64	24 (16)	16	8
16,600	204	68	27 (18)	17	9
17,600	216	72	27 (18)	18	9
18,700	228	76	30 (20)	19	10
19,700	240	80	30 (20)	20	10

Analog integration (4-port board)

[Table 65](#) provides information about the analog integration (4-port board) recommendation for Modular Messaging—Exchange with Avaya S3500 MAS units.

Table 65: Analog integration (4-port board) recommendation (S3500 MAS)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	4-port boards	MAS units
95	4	4	2 (2)	1	1
300	8	8	2 (2)	2	1

Note:

Analog systems with 4-port cards can be purchased as a new system in 4-port and 8-port configurations only. For larger systems, use configurations with 12-port analog cards.

Recommendations with a software-only configuration

A software-only configuration is a configuration in which Avaya provides the Modular Messaging software and the customer provides the hardware. This section provides information about the port sizing recommendations of a software-only configuration with Modular Messaging—Exchange, Release 3.

SIP integration

[Table 66](#) provides information about the SIP integration recommendation for Modular Messaging—Exchange in a software-only configuration.

Table 66: SIP integration recommendation (software-only)

Subscriber mailboxes	Voice ports	E-mail readers recommended (Included)	MAS units
3,400	48	5 (2)	1
7,400	96	10 (4)	2
11,500	144	15 (6)	3
Larger systems require a Supplementary Server.			
15,600	192	20 (8)	4
19,700	240	25 (10)	5

H.323 integration

[Table 67](#) provides information about the H.323 integration recommendation for Modular Messaging—Exchange in a software-only configuration.

Table 67: H.323 integration recommendation (software-only)

Subscriber mailboxes	Voice ports	E-mail readers recommended (Included)	MAS units
1,900	30	4 (2)	1
4,300	60	8 (4)	2
6,900	90	12 (6)	3
Larger systems require a Supplementary Server.			
9,400	120	16 (8)	4
11,500	144	20 (10)	5
12,000	150	20 (10)	5
14,500	180	24 (12)	6
17,100	210	28 (14)	7
19,700	240	32 (16)	8

T1 QSIG integration

[Table 68](#) provides information about the T1 QSIG integration recommendation for Modular Messaging—Exchange in a software-only configuration.

Table 68: T1 QSIG integration recommendation (software-only)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	23-port T1 boards	MAS units
1,400	23	15	3 (2)	1	1
3,200	46	30	5 (2)	2	1
5,100	69	45	8 (4)	3	2
7,000	92	60	10 (4)	4	2
9,000	115	75	13 (6)	5	3
11,000	138	90	15 (6)	6	3
Larger systems require a Supplementary Server.					
11,500	144	96	18 (8)	7	4
12,900	161	105	18 (8)	7	4
14,900	184	120	20 (8)	8	4
16,800	207	135	23 (10)	9	5
18,800	230	150	25 (10)	10	5

E1 QSIG integration

[Table 69](#) provides information about the E1 QSIG integration recommendation for Modular Messaging—Exchange in a software-only configuration.

Table 69: E1 QSIG integration recommendation (software-only)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	30-port E1 boards	MAS units
1,900	30	16	4 (2)	1	1
4,300	60	32	5 (2)	2	1
6,900	90	48	9 (4)	3	2
9,400	120	64	10 (4)	4	2
Larger systems require a Supplementary Server.					
11,500	144	80	14 (6)	5	3
12,000	150	80	14 (6)	5	3
14,500	180	96	15 (6)	6	3
17,100	210	112	19 (8)	7	4
19,700	240	128	20 (8)	8	4

Digital Set Emulation integration

[Table 70](#) provides information about the DSE integration recommendation for Modular Messaging—Exchange in a software-only configuration.

Table 70: DSE integration recommendation (software-only)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	8-port DSE boards	MAS units
300	8	2	2 (2)	1	1
900	16	4	3 (2)	2	1
1,500	24	6	3 (2)	3	1
2,100	32	8	4 (2)	4	1
2,700	40	10	6 (4)	5	2
3,400	48	12	6 (4)	6	2
4,000	56	14	7 (4)	7	2
4,700	64	16	8 (4)	8	2
5,300	72	18	9 (6)	9	3
6,000	80	20	10 (6)	10	3
6,700	88	22	11 (6)	11	3
7,400	96	24	12 (6)	12	3
Larger systems require a Supplementary Server.					
8,000	104	26	13 (8)	13	4
8,700	112	28	14 (8)	14	4
9,400	120	30	15 (8)	15	4
10,100	128	32	16 (8)	16	4
10,800	136	34	17 (10)	17	5
11,500	144	36	18 (10)	18	5
12,100	152	38	19 (10)	19	5
12,800	160	40	20 (10)	20	5
13,500	168	42	21 (12)	21	6
14,200	176	44	22 (12)	22	6

Table 70: DSE integration recommendation (software-only) (continued)

14,900	184	46	23 (12)	23	6
15,600	192	48	24 (12)	24	6
16,200	200	50	25 (14)	25	7
16,900	208	52	26 (14)	26	7
17,600	216	54	27 (14)	27	7
18,300	224	56	28 (14)	28	7
19,000	232	58	29 (16)	29	8
19,700	240	60	30 (16)	30	8

Analog integration (12-port board)

[Table 71](#) provides information about the analog integration (12-port board) recommendation for Modular Messaging—Exchange in a software-only configuration.

Table 71: Analog integration (12-port board) recommendation (software-only)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	12-port analog boards	MAS units
600	12	4	3 (2)	1	1
1,500	24	8	3 (2)	2	1
2,400	36	12	4 (2)	3	1
3,400	48	16	5 (2)	4	1
4,300	60	20	7 (4)	5	2
5,300	72	24	8 (4)	6	2
6,400	84	28	9 (4)	7	2
7,400	96	32	10 (4)	8	2
8,400	108	36	12 (6)	9	3
9,400	120	40	13 (6)	10	3
10,400	132	44	14 (6)	11	3
11,500	144	48	15 (6)	12	3
Larger systems require a Supplementary Server.					
12,500	156	52	17 (8)	13	4
13,500	168	56	18 (8)	14	4
14,500	180	60	19 (8)	15	4
15,600	192	64	20 (8)	16	4
16,600	204	68	22 (10)	17	5
17,600	216	72	23 (10)	18	5
18,700	228	76	24 (10)	19	5
19,700	240	80	25 (10)	20	5

Analog integration (4-port board)

[Table 72](#) provides information about the analog integration (4-port board) recommendation for Modular Messaging—Exchange in a software-only configuration.

Table 72: Analog integration (4-port board) recommendation (software-only)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	4-port analog boards	MAS units
95	4	4	2 (2)	1	1
300	8	8	2 (2)	2	1

Note:

Analog systems with 4-port cards can be purchased as a new system in 4-port and 8-port configurations only. For larger systems, use configurations with 12-port analog cards.

Recommendations with Avaya S3400 MAS units

The port sizing recommendations for a Modular Messaging—Exchange system with Avaya S3400 MAS units depend on the TUI in use.

Modular Messaging Aria TUI recommendations

The Modular Messaging Aria TUI recommendations provide port sizing calculations for systems with all subscriber mailboxes enabled only for the Modular Messaging Aria TUI.

SIP integration

[Table 73](#) provides information about the SIP integration recommendation for Modular Messaging—Exchange with Avaya S3400 MAS units.

Table 73: SIP integration recommendation (Avaya S3400 MAS, Aria TUI only)

Subscriber mailboxes	Voice ports	E-mail readers recommended (Included)	MAS units
1,200	20	3 (2)	1
2,700	40	6 (4)	2
4,300	60	9 (6)	3
Larger systems require a Supplementary Server.			
6,000	80	12 (8)	4
7,700	100	15 (10)	5
9,400	120	18 (12)	6
11,100	140	21 (14)	7
12,800	160	24 (16)	8
14,500	180	27 (18)	9
16,200	200	30 (20)	10

H.323 integration

[Table 74](#) provides information about the H.323 integration recommendation for Modular Messaging—Exchange with Avaya S3400 MAS units.

Table 74: H.323 integration recommendation (Avaya S3400 MAS, Aria TUI only)

Subscriber mailboxes	Voice ports	E-mail readers recommended (Included)	MAS units
1,200	20	3 (2)	1
2,700	40	6 (4)	2
4,300	60	9 (6)	3
Larger systems require a Supplementary Server.			
6,000	80	12 (8)	4
7,700	100	15 (10)	5
9,400	120	18 (12)	6
11,100	140	21 (14)	7
12,800	160	24 (16)	8
14,500	180	27 (18)	9
16,200	200	30 (20)	10

T1 QSIG integration

[Table 75](#) provides information about the T1 QSIG integration recommendation for Modular Messaging—Exchange with Avaya S3400 MAS units.

Table 75: T1 QSIG integration recommendation (Avaya S3400 MAS, Aria TUI only)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	23-port T1 boards	MAS units
1,400	23	15	3 (2)	1	1
3,200	46	30	5 (2)	2	1
5,100	69	45	8 (4)	3	2
7,000	92	60	10 (4)	4	2
9,000	115	75	13 (6)	5	3
11,000	138	90	15 (6)	6	3

Table 75: T1 QSIG integration recommendation (Avaya S3400 MAS, Aria TUI only)

Larger systems require a Supplementary Server.					
11,500	144	96	18 (8)	7	4
12,900	161	105	18 (8)	7	4
14,900	184	120	20 (8)	8	4
16,800	207	135	23 (10)	9	5
18,800	230	150	25 (10)	10	5

E1 QSIG integration

[Table 76](#) provides information about the E1 QSIG integration recommendation for Modular Messaging—Exchange with Avaya S3400 MAS units.

Table 76: E1 QSIG integration recommendation (Avaya S3400 MAS, Aria TUI only)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	30-port E1 boards	MAS units
1,900	30	16	4 (2)	1	1
4,300	60	32	8 (4)	2	2
6,900	90	48	12 (6)	3	3
Larger systems require a Supplementary Server.					
9,400	120	64	16 (8)	4	4
11,500	144	80	19 (10)	5	5
12,000	150	80	20 (10)	5	5
14,500	180	96	24 (12)	6	6
17,100	210	112	28 (14)	7	7
19,700	240	128	32 (16)	8	8

Digital Set Emulation integration

[Table 77](#) provides information about the DSE integration recommendation for Modular Messaging—Exchange with Avaya S3400 MAS units.

Table 77: DSE integration recommendation (Avaya S3400 MAS, Aria TUI only)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	8-port DSE boards	MAS units
300	8	2	2 (2)	1	1
900	16	4	3 (2)	2	1
1,500	24	6	3 (2)	3	1
2,100	32	8	4 (2)	4	1
2,700	40	10	6 (4)	5	2
3,400	48	12	6 (4)	6	2
4,000	56	14	7 (4)	7	2
4,700	64	16	8 (4)	8	2
5,300	72	18	9 (6)	9	3
6,000	80	20	10 (6)	10	3
6,700	88	22	11 (6)	11	3
7,400	96	24	12 (6)	12	3
Larger systems require a Supplementary Server.					
8,000	104	26	13 (8)	13	4
8,700	112	28	14 (8)	14	4
9,400	120	30	15 (8)	15	4
10,100	128	32	16 (8)	16	4
10,800	136	34	17 (10)	17	5
11,500	144	36	18 (10)	18	5
12,100	152	38	19 (10)	19	5
12,800	160	40	20 (10)	20	5
13,500	168	42	21 (12)	21	6
14,200	176	44	22 (12)	22	6

Table 77: DSE integration recommendation (Avaya S3400 MAS, Aria TUI only) (continued)

14,900	184	46	23 (12)	23	6
15,600	192	48	24 (12)	24	6
16,200	200	50	25 (14)	25	7
16,900	208	52	26 (14)	26	7
17,600	216	54	27 (14)	27	7
18,300	224	56	28 (14)	28	7
19,000	232	58	29 (16)	29	8
19,700	240	60	30 (16)	30	8

Analog integration (12-port board)

[Table 78](#) provides information about the analog integration (12-port board) recommendation for Modular Messaging—Exchange with Avaya S3400 MAS units.

Table 78: Analog integration 12-port board recommendation (Avaya S3400 MAS, Aria TUI only)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	12-port analog boards	MAS units
600	12	4	3 (2)	1	1
1,500	24	8	3 (2)	2	1
2,400	36	12	4 (2)	3	1
3,400	48	16	5 (2)	4	1
4,300	60	20	7 (4)	5	2
5,300	72	24	8 (4)	6	2
6,400	84	28	9 (4)	7	2
7,400	96	32	10 (4)	8	2
8,400	108	36	12 (6)	9	3
9,400	120	40	13 (6)	10	3
10,400	132	44	14 (6)	11	3
11,500	144	48	15 (6)	12	3
Larger systems require a Supplementary Server.					
12,500	156	52	17 (8)	13	4
13,500	168	56	18 (8)	14	4
14,500	180	60	19 (8)	15	4
15,600	192	64	20 (8)	16	4
16,600	204	68	22 (10)	17	5
17,600	216	72	23 (10)	18	5
18,700	228	76	24 (10)	19	5
19,700	240	80	25 (10)	20	5

Port Sizing

Analog integration (4-port board)

[Table 79](#) provides information about the analog integration (4-port board) recommendation for Modular Messaging—Exchange with Avaya S3400 MAS units.

Table 79: Analog integration 4-port board recommendation (Avaya S3400 MAS, Aria TUI only)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	4-port analog boards	MAS units
95	4	4	2 (2)	1	1
300	8	8	2 (2)	2	1

Note:

Analog systems with 4-port cards can be purchased as a new system in 4-port and 8-port configurations only. For larger systems, use configurations with 12-port analog cards.

AUDIX TUI or Serenade TUI

These recommendations provide port sizing recommendations for systems with subscriber mailboxes enabled for the Modular Messaging AUDIX TUI, Modular Messaging Serenade TUI, or a combination of any of the Modular Messaging TUIs.

SIP integration

[Table 80](#) provides information about the SIP integration recommendation for Modular Messaging—Exchange with Avaya S3400 MAS units.

Table 80: SIP integration recommendation (Avaya S3400 MAS, AUDIX or Serenade TUI)

Subscriber mailboxes	Voice ports	E-mail readers recommended (Included)	MAS units
1,200	20	3 (2)	1
2,700	40	6 (4)	2
4,300	60	9 (6)	3
Larger systems require a Supplementary Server.			
6,000	80	12 (8)	4
7,700	100	15 (10)	5
9,400	120	18 (12)	6
11,100	140	21 (14)	7
12,800	160	24 (16)	8
14,500	180	27 (18)	9
16,200	200	30 (20)	10

H.323 integration

[Table 81](#) provides information about the H.323 integration recommendation for Modular Messaging—Exchange with Avaya S3400 MAS units.

Table 81: H.323 integration recommendation (Avaya S3400 MAS, AUDIX or Serenade TUI)

Subscriber mailboxes	Voice ports	E-mail readers recommended (Included)	MAS units
1,200	20	3 (2)	1
2,700	40	6 (4)	2
4,300	60	9 (6)	3
Larger systems require a Supplementary Server.			
6,000	80	12 (8)	4
7,700	100	15 (10)	5
9,400	120	18 (12)	6
11,100	140	21 (14)	7
12,800	160	24 (16)	8
14,500	180	27 (18)	9
16,200	200	30 (20)	10

T1 QSIG integration

[Table 82](#) provides information about the T1 QSIG integration recommendation for Modular Messaging—Exchange with Avaya S3400 MAS units.

Table 82: T1 QSIG integration recommendation (Avaya S3400 MAS, AUDIX or Serenade TUI)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	23-port T1 boards	MAS units
1,400	23	15	3 (2)	1	1
3,200	46	30	6 (4)	2	2
5,100	69	45	9 (6)	3	3
Larger systems require a Supplementary Server.					

Table 82: T1 QSIG integration recommendation (Avaya S3400 MAS, AUDIX or Serenade TUI)

7,000	92	60	12 (8)	4	4
9,000	115	75	15 (10)	5	5
11,000	138	90	18 (12)	6	6
12,900	161	105	21 (14)	7	7
14,900	184	120	24 (16)	8	8
16,800	207	135	27 (18)	9	9
18,800	230	150	30 (20)	10	10

E1 QSIG integration

[Table 83](#) provides information about the E1 QSIG integration recommendation for Modular Messaging—Exchange with Avaya S3400 MAS units.

Table 83: E1 QSIG integration recommendation (Avaya S3400 MAS, AUDIX or Serenade TUI)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	30-port E1 boards	MAS units
1,900	30	16	4 (2)	1	1
4,300	60	32	8 (4)	2	2
6,900	90	48	12 (6)	3	3
Larger systems require a Supplementary Server.					
9,400	120	64	16 (8)	4	4
11,500	144	80	19 (10)	5	5
12,000	150	80	20 (10)	5	5
14,500	180	96	24 (12)	6	6
17,100	210	112	28 (14)	7	7
19,700	240	128	32 (16)	8	8

Port Sizing

Digital Set Emulation integration

[Table 84](#) provides information about the DSE integration recommendation for Modular Messaging—Exchange with Avaya S3400 MAS units.

Table 84: DSE integration recommendation (Avaya S3400 MAS, AUDIX or Serenade TUI)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	8-port DSE boards	MAS units
300	8	2	2 (2)	1	1
900	16	4	3 (2)	2	1
1,500	24	6	3 (2)	3	1
2,100	32	8	6 (4)	4	2
2,700	40	10	6 (4)	5	2
3,400	48	12	6 (4)	6	2
4,000	56	14	9 (6)	7	3
4,700	64	16	9 (6)	8	3
5,300	72	18	9 (6)	9	3
Larger systems require a Supplementary Server.					
6,000	80	20	12 (8)	10	4
6,700	88	22	12 (8)	11	4
7,400	96	24	12 (8)	12	4
8,000	104	26	15 (10)	13	5
8,700	112	28	15 (10)	14	5
9,400	120	30	15 (10)	15	5
10,100	128	32	18 (12)	16	6
10,800	136	34	18 (12)	17	6
11,500	144	36	18 (12)	18	6
12,100	152	38	21 (14)	19	7
12,800	160	40	21 (14)	20	7
13,500	168	42	21 (14)	21	7
14,200	176	44	24 (16)	22	8

Table 84: DSE integration recommendation (Avaya S3400 MAS, AUDIX or Serenade TUI)

14,900	184	46	24 (16)	23	8
15,600	192	48	24 (16)	24	8
16,200	200	50	27 (18)	25	9
16,900	208	52	27 (18)	26	9
17,600	216	54	27 (18)	27	9
18,300	224	56	30 (20)	28	10
19,000	232	58	30 (20)	29	10
19,700	240	60	30 (20)	30	10

Analog integration (12-port board)

[Table 85](#) provides information about the analog integration (12-port board) recommendation for Modular Messaging—Exchange with Avaya S3400 MAS units.

Table 85: Analog integration (12-port board) recommendation (Avaya S3400 MAS, AUDIX or Serenade TUI)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	12-port boards	MAS units
600	12	4	3 (2)	1	1
1,500	24	8	3 (2)	2	1
2,400	36	12	6 (4)	3	2
3,400	48	16	6 (4)	4	2
4,300	60	20	9 (6)	5	3
5,300	72	24	9 (6)	6	3
Larger systems require a Supplementary Server.					
6,400	84	28	12 (8)	7	4
7,400	96	32	12 (8)	8	4
8,400	108	36	15 (10)	9	5
9,400	120	40	15 (10)	10	5
10,400	132	44	18 (12)	11	6
11,500	144	48	18 (12)	12	6
12,500	156	52	21 (14)	13	7
13,500	168	56	21 (14)	14	7
14,500	180	60	24 (16)	15	8
15,600	192	64	24 (16)	16	8
16,600	204	68	27 (18)	17	9
17,600	216	72	27 (18)	18	9
18,700	228	76	30 (20)	19	10
19,700	240	80	30 (20)	20	10

Analog integration (4-port board)

[Table 86](#) provides information about the analog integration (4-port board) recommendation for Modular Messaging—Exchange with Avaya S3400 MAS units.

Table 86: Analog integration (4-port board) recommendation (Avaya S3400 MAS, AUDIX or Serenade TUI)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	4-port boards	MAS units
95	4	4	2 (2)	1	1
300	8	8	2 (2)	2	1

Note:

Analog systems with 4-port cards can be purchased as a new system in 4-port and 8-port configurations only. For larger systems, use configurations with 12-port analog cards.

Recommendations for Modular Messaging—Domino

IBM Lotus Domino

Consider the following items before referring to the recommendations:

- Typically, subscribers use GUI clients for messaging; therefore, port usage is lower, with 4.5 minutes of messaging per day per subscriber (including text-to-speech conversion of corporate e-mail messages).

The connect time for mobile subscribers increases because of access to e-mail messages, but connect time for desktop users decreases relative to traditional voice mail because of accessing messages over the LAN. The net effect is lower port usage per user.

- These recommendations provide for traffic patterns of 14% busy-hour traffic.
- These recommendations are applicable to SWINs that support queuing and to switches that do not support queuing. SWINs that support queuing allow calls to be queued on the switch until a port is available on the Modular Messaging system. SWINs that do not support queuing cause callers to hear a busy signal when no ports are available on the Modular Messaging system.

The recommendations reflect both nonqueuing and queuing sizing recommendations. Nonqueuing sizing recommendations use the Erlang B model and P.02 GOS. Queuing sizing recommendations use the Erlang C model and P.05 GOS. Currently, most Modular Messaging SWINs do not support switch queuing. For example, the Avaya Communication Manager QSIG integration implementation does not support queuing.

- These recommendations are based on Erlang B with P.02 GOS and Erlang C with P.05 GOS.

The Erlang B model represents a scenario in which incoming calls are not queued on the switch. The Erlang C model represents a scenario in which incoming calls are queued on the switch.

- Calculations are based on the assumption that the system is used for all messaging types, including voice, fax, and e-mail.
- The number of subscriber mailboxes is rounded to the nearest hundred.

Recommendations with Avaya S3500 MAS units

This section provides information about the port sizing recommendations for Modular Messaging—Domino systems with Avaya S3500 MAS units.

SIP integration

[Table 87](#) provides information about the SIP integration recommendation for Modular Messaging—Domino with Avaya S3500 MAS units.

Table 87: SIP integration recommendation (S3500 MAS)

Subscriber mailboxes	Voice ports	E-mail readers recommended (Included)	MAS units
3,400	48	5 (2)	1
7,400	96	10 (4)	2
11,500	144	15 (6)	3
Larger systems require a Supplementary Server.			
15,600	192	20 (8)	4
19,700	240	25 (10)	5

H.323 integration

[Table 88](#) provides information about the H.323 integration recommendation for Modular Messaging—Domino with Avaya S3500 MAS units.

Table 88: H.323 integration recommendation (S3500 MAS)

Subscriber mailboxes	Voice ports	E-mail readers recommended (Included)	MAS units
1,900	30	4 (2)	1
4,300	60	8 (4)	2
6,900	90	12 (6)	3
Larger systems require a Supplementary Server.			
9,400	120	16 (8)	4
11,500	144	20 (10)	5
12,000	150	20 (10)	5

Table 88: H.323 integration recommendation (S3500 MAS)

14,500	180	24 (12)	6
17,100	210	28 (14)	7
19,700	240	32 (16)	8

T1 QSIG integration

[Table 89](#) provides information about the T1 QSIG integration recommendation for Modular Messaging—Domino with Avaya S3500 MAS units.

Table 89: T1 QSIG integration recommendation (S3500 MAS)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	23-port T1 boards	MAS units
1,400	23	15	3 (2)	1	1
3,200	46	30	5 (2)	2	1
5,100	69	45	8 (4)	3	2
7,000	92	60	10 (4)	4	2
9,000	115	75	13 (6)	5	3
11,000	138	90	15 (6)	6	3
Larger systems require a Supplementary Server.					
11,500	144	96	18 (8)	7	4
12,900	161	105	18 (8)	7	4
14,900	184	120	20 (8)	8	4
16,800	207	135	23 (10)	9	5
18,800	230	150	25 (10)	10	5

E1 QSIG integration

[Table 90](#) provides information about the E1 QSIG integration recommendation for Modular Messaging—Domino with Avaya S3500 MAS units.

Table 90: E1 QSIG integration recommendation (S3500 MAS)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	30-port E1 boards	MAS units
1,900	30	16	4 (2)	1	1
4,300	60	32	5 (2)	2	1
6,900	90	48	9 (4)	3	2
9,400	120	64	10 (4)	4	2
Larger systems require a Supplementary Server.					
11,500	144	80	14 (6)	5	3
12,000	150	80	14 (6)	5	3
14,500	180	96	15 (6)	6	3
17,100	210	112	19 (8)	7	4
19,700	240	128	20 (8)	8	4

Digital Set Emulation integration

[Table 91](#) provides information about the DSE integration recommendation for Modular Messaging—Domino with Avaya S3500 MAS units.

Table 91: DSE integration recommendation (S3500 MAS)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	8-port DSE boards	MAS units
300	8	2	2 (2)	1	1
900	16	4	3 (2)	2	1
1,500	24	6	5 (4)	3	2
2,100	32	8	6 (4)	4	2
2,700	40	10	8 (6)	5	3
3,400	48	12	9 (6)	6	3
4,000	56	14	11 (8)	7	4
4,700	64	16	12 (8)	8	4
5,300	72	18	14 (10)	9	5
6,000	80	20	15 (10)	10	5
6,700	88	22	17 (12)	11	6
7,400	96	24	18 (12)	12	6
8,000	104	26	20 (14)	13	7
8,700	112	28	21 (14)	14	7
9,400	120	30	23 (16)	15	8
10,100	128	32	24 (16)	16	8
10,800	136	34	26 (18)	17	9
11,500	144	36	27 (18)	18	9
12,100	152	38	29 (20)	19	10
12,800	160	40	30 (20)	20	10

Analog integration (12-port board)

[Table 92](#) provides information about the analog integration (12-port board) recommendation for Modular Messaging—Domino with Avaya S3500 MAS units.

Table 92: Analog integration (12-port board) recommendation (S3500 MAS)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	12-port boards	MAS units
600	12	4	3 (2)	1	1
1,500	24	8	3 (2)	2	1
2,400	36	12	6 (4)	3	2
3,400	48	16	6 (4)	4	2
4,300	60	20	9 (6)	5	3
5,300	72	24	9 (6)	6	3
6,400	84	28	12 (8)	7	4
7,400	96	32	12 (8)	8	4
8,400	108	36	15 (10)	9	5
9,400	120	40	15 (10)	10	5
10,400	132	44	18 (12)	11	6
11,500	144	48	18 (12)	12	6
12,500	156	52	21 (14)	13	7
13,500	168	56	21 (14)	14	7
14,500	180	60	24 (16)	15	8
15,600	192	64	24 (16)	16	8
16,600	204	68	27 (18)	17	9
17,600	216	72	27 (18)	18	9
18,700	228	76	30 (20)	19	10
19,700	240	80	30 (20)	20	10

Analog integration (4-port board)

[Table 93](#) provides information about the analog integration (4-port board) recommendation for Modular Messaging—Domino with Avaya S3500 MAS units.

Table 93: Analog integration (4-port board) recommendation (S3500 MAS)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	4-port boards	MAS units
95	4	4	2 (2)	1	1
300	8	8	2 (2)	2	1

Note:

Analog systems with 4-port cards can be purchased as a new system in 4-port and 8-port configurations only. For larger systems, use configurations with 12-port analog cards.

Recommendations with a software-only configuration

A software-only configuration is a configuration in which Avaya provides the Modular Messaging software and the customer provides the hardware. This section provides information about the port sizing recommendations of a software-only configuration with Modular Messaging—Domino.

SIP integration

[Table 94](#) provides information about the SIP integration recommendation for Modular Messaging—Domino in a software-only configuration.

Table 94: SIP integration recommendation (software-only)

Subscriber mailboxes	Voice ports	E-mail readers recommended (Included)	MAS units
3,400	48	5 (2)	1
7,400	96	10 (4)	2
11,500	144	15 (6)	3
Larger systems require a Supplementary Server.			
15,600	192	20 (8)	4
19,700	240	25 (10)	5

H.323 integration

[Table 95](#) provides information about the H.323 integration recommendation for Modular Messaging—Domino in a software-only configuration.

Table 95: H.323 integration recommendation (software-only)

Subscriber mailboxes	Voice ports	E-mail readers recommended (Included)	MAS units
1,900	30	4 (2)	1
4,300	60	8 (4)	2
6,900	90	12 (6)	3
Larger systems require a Supplementary Server.			
9400	120	16 (8)	4
11,500	144	20 (10)	5
12,000	150	20 (10)	5
14,500	180	24 (12)	6
17,100	210	28 (14)	7
19,700	240	32 (16)	8

T1 QSIG integration

[Table 96](#) provides information about the T1 QSIG integration recommendation for Modular Messaging—Domino in a software-only configuration.

Table 96: T1 QSIG integration recommendation (software-only)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	23-port T1 boards	MAS units
1,400	23	15	3 (2)	1	1
3,200	46	30	5 (2)	2	1
5,100	69	45	8 (4)	3	2
7,000	92	60	10 (4)	4	2
9,000	115	75	13 (6)	5	3
11,000	138	90	15 (6)	6	3
Larger systems require a Supplementary Server.					
11,500	144	96	18 (8)	7	4
12,900	161	105	18 (8)	7	4
14,900	184	120	20 (8)	8	4
16,800	207	135	23 (10)	9	5
18,800	230	150	25 (10)	10	5

E1 QSIG integration

[Table 97](#) provides information about the E1 QSIG integration recommendation for Modular Messaging—Domino in a software-only configuration.

Table 97: E1 QSIG integration recommendation (software-only)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	30-port E1 boards	MAS units
1,900	30	16	4 (2)	1	1
4,300	60	32	5 (2)	2	1
6,900	90	48	9 (4)	3	2
9,400	120	64	10 (4)	4	2
Larger systems require a Supplementary Server.					
11,500	144	80	14 (6)	5	3
12,000	150	80	14 (6)	5	3
14,500	180	96	15 (6)	6	3
17,100	210	112	19 (8)	7	4
19,700	240	128	20 (8)	8	4

Digital Set Emulation integration

[Table 98](#) provides information about the DSE integration recommendation for Modular Messaging—Domino in a software-only configuration.

Table 98: DSE integration recommendation (software-only)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	8-port DSE boards	MAS units
300	8	2	2 (2)	1	1
900	16	4	3 (2)	2	1
1,500	24	6	3 (2)	3	1
2,100	32	8	4 (2)	4	1
2,700	40	10	6 (4)	5	2
3,400	48	12	6 (4)	6	2
4,000	56	14	7 (4)	7	2
4,700	64	16	8 (4)	8	2
5,300	72	18	9 (6)	9	3
6,000	80	20	10 (6)	10	3
6,700	88	22	11 (6)	11	3
7,400	96	24	12 (6)	12	3
Larger systems require a Supplementary Server.					
8,000	104	26	13 (8)	13	4
8,700	112	28	14 (8)	14	4
9,400	120	30	15 (8)	15	4
10,100	128	32	16 (8)	16	4
10,800	136	34	17 (10)	17	5
11,500	144	36	18 (10)	18	5
12,100	152	38	19 (10)	19	5
12,800	160	40	20 (10)	20	5
13,500	168	42	21 (12)	21	6
14,200	176	44	22 (12)	22	6

Table 98: DSE integration recommendation (software-only) (continued)

14,900	184	46	23 (12)	23	6
15,600	192	48	24 (12)	24	6
16,200	200	50	25 (14)	25	7
16,900	208	52	26 (14)	26	7
17,600	216	54	27 (14)	27	7
18,300	224	56	28 (14)	28	7
19,000	232	58	29 (16)	29	8
19,700	240	60	30 (16)	30	8

Analog integration (12-port board)

[Table 99](#) provides information about the analog integration (12-port board) recommendation for Modular Messaging—Domino in a software-only configuration.

Table 99: Analog integration (12-port board) recommendation (software-only)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	12-port analog boards	MAS units
600	12	4	3 (2)	1	1
1,500	24	8	3 (2)	2	1
2,400	36	12	4 (2)	3	1
3,400	48	16	5 (2)	4	1
4,300	60	20	7 (4)	5	2
5,300	72	24	8 (4)	6	2
6,400	84	28	9 (4)	7	2
7,400	96	32	10 (4)	8	2
8,400	108	36	12 (6)	9	3
9,400	120	40	13 (6)	10	3
10,400	132	44	14 (6)	11	3
11,500	144	48	15 (6)	12	3
Larger systems require a Supplementary Server.					
12,500	156	52	17 (8)	13	4
13,500	168	56	18 (8)	14	4
14,500	180	60	19 (8)	15	4
15,600	192	64	20 (8)	16	4
16,600	204	68	22 (10)	17	5
17,600	216	72	23 (10)	18	5
18,700	228	76	24 (10)	19	5
19,700	240	80	25 (10)	20	5

Analog integration (4-port board)

[Table 100](#) provides information about the analog integration (4-port board) recommendation for Modular Messaging—Domino in a software-only configuration.

Table 100: Analog integration (4-port board) recommendation (software-only)

Subscriber mailboxes	Voice ports	Fax ports	E-mail readers recommended (Included)	4-port analog boards	MAS units
95	4	4	2 (2)	1	1
300	8	8	2 (2)	2	1

Note:

Analog systems with 4-port cards can be purchased as a new system in 4-port and 8-port configurations only. For larger systems, use configurations with 12-port analog cards.

Identifying the recommended configuration for a customer

Modular Messaging recommendations make it easier for planners to estimate the number of voice ports the system requires for a given number of subscribers. The recommendations also provide information about the number of MAS units and e-mail readers a system needs for a given combination of voice ports and subscribers.

To identify which Modular Messaging recommendation a customer needs, planners must know the approximate number of subscribers and the integration protocol that the system will use.

Consider the example of an organization implementing a Modular Messaging—Exchange system to provide services to approximately 4,000 subscribers.

Further specifications include:

- The customer has purchased a software-only configuration that is, Avaya-provided software and customer-provided hardware.
- The Modular Messaging system connects to the telephone system using H.323 integration.

For such an implementation, a planner can consider the Modular Messaging H.323 integration recommendation for Modular Messaging—Exchange. See [Table 74](#).

The Modular Messaging H.323 integration recommendation provides support for 60 voice ports that service 4,300 subscribers of Modular Messaging—Exchange.

The system requires three MAS units to support 60 ports.

Estimating the additional e-mail readers required

When Modular Messaging subscribers use the TUI to retrieve e-mail messages, Modular Messaging renders the messages in a computer-generated spoken voice. This computer-generated voice reads out the envelope information of messages and contents of e-mail messages.

The conversion of TTS is achieved by licensed speech synthesis software, known as e-mail readers. TTS conversion is also used to convert the text names of mailboxes when subscribers have not recorded their spoken names and to read envelope information.

Modular Messaging includes two e-mail readers bundled with each MAS. These two e-mail readers enable two concurrent TTS conversions per MAS. If subscribers are likely to make extensive use of the TUIs to retrieve e-mail and fax messages, customers might need to purchase additional e-mail readers.

Modular Messaging—MSS

Avaya MSS

Subscribers of Modular Messaging—MSS can use the TUI to access voice and fax messages. Because subscribers cannot use the TUI to access corporate e-mail messages, use of e-mail readers is primarily for TTS conversion of message headers, subjects, and spoken names of subscribers. For such use, the default number of e-mail readers is sufficient.

With Modular Messaging—MSS, the e-mail reader capacity for a VMD is two times the number of MAS units. Customers cannot purchase additional e-mail readers.

Modular Messaging—Exchange and Modular Messaging—Domino

Microsoft Exchange

IBM Lotus Domino

Subscribers of Modular Messaging—Exchange and Modular Messaging—Domino can use the TUI to access voice, fax, and corporate e-mail messages. The Modular Messaging recommendations indicate the number of e-mail readers recommended.

The Modular Messaging recommendations assume that when using the TUI to retrieve messages, subscribers are likely to spend 60% of the message retrieval time for TTS conversion of e-mail messages. When a message is played using TTS conversion, an e-mail reader is required for 10% of the actual message play time.

With Modular Messaging—Exchange and Modular Messaging—Domino, an MAS supports a maximum of 12 e-mail readers, enabling 12 concurrent TTS conversions on an MAS.

To calculate the number of additional e-mail readers required, see the **E-mail readers recommended for e-mail (Included)** column of the Modular Messaging recommendations. Each MAS application license includes two TTS resources.

The calculation for additional e-mail readers is:

(Number of e-mail readers recommended) – (Number of e-mail readers included)

The number of e-mail readers purchased is for the entire VMD. Customers are responsible for allocating e-mail readers among the MAS units in the VMD. Avaya advises customers to allocate e-mail readers in proportion to the number of ports on each MAS.

Note:

E-mail readers once allocated to specific MAS units are dynamically available for all ports on that MAS and are unavailable for ports on other MAS units. Customers might reallocate e-mail readers to MAS units at any time by using the Voice Mail System Configuration (VMSC) tool on the MAS.

Port sizing without using Modular Messaging recommendations

Planners that have sufficient prior experience in planning and implementing messaging systems might prefer to carry out the port sizing exercise without referring to the Modular Messaging recommendations.

This section provides guidelines and calculations that planners can use to make estimations, such as traffic generated during the busy hour, port usage, storage capacity, and additional TTS resources.

Concepts a planner must know

Before a planner estimates port requirements, a planner must be familiar with the following concepts.

Busy hour: Busy hour is the one-hour period of the day when traffic intensity is the highest.

Suppose that during the busiest day of a business week, a total of 3,500 calls are received. The hour between 9:00 a.m. and 10:00 a.m. experiences the heaviest traffic, with 490 incoming calls. This makes 9:00 a.m. to 10:00 a.m. the busy hour.

Another way of expressing busy-hour traffic is as a percentage of total daily traffic. In the example above, 490 busy-hour calls is 14% of the 3,500 calls received for the day.

Determining the busy hour: Most switches can generate traffic reports that provide statistics on a weekly, daily, or hourly basis. Usually these reports break up the traffic statistics by type of call, for example, incoming calls, outgoing calls, and calls to specific hunt groups. Use these reports to determine what the specific traffic patterns are and when the busy hour occurs. If traffic statistics are unavailable, an educated guess at busy-hour traffic is required. The default planning assumption is 14%.

When calculating the busy hour, planners must realize that the busy hour for different divisions or user groups might vary. For example, in an organization that has 1,000 employees in the sales division and 2,000 employees in the technical support division, the busy hour for the sales division may be different from that of the technical support division. Calculate the busy hour for the entire organization.

Units of measurement for busy-hour traffic: Busy-hour traffic is normally expressed in minutes, Erlangs, or Centum Call Seconds (CCSs), using the formula:

Busy-hour traffic in Erlangs = (Calls during busy hour x Average duration of each call) /3600

For example:

- Number of calls generated during busy hour = 120
- Average duration of each call = 30 seconds

Port Sizing

- Busy-hour traffic = $(120 \times 30) / 3600 = 1$ Erlang
- 1 Erlang of busy-hour traffic = 3,600 call seconds, or 60 call minutes, or 36 CCSs of busy-hour traffic

Note:

1 CCS = 100 call seconds. There are 3,600 seconds in 1 hour.
 $3,600 \text{ call seconds} / 60 = 60 \text{ call minutes} / 60 = 1 \text{ call hour or Erlang} = 36 \text{ CCSs}$

Busy-hour offered traffic: Busy-hour offered traffic is the total traffic offered to a group of ports during the busy hour. Traffic includes calls that are delayed or blocked. Offered traffic is usually expressed in minutes, Erlangs, or CCSs.

GOS: GOS is the probability that an incoming call is significantly delayed or blocked because all ports are in use.

With switches that support queueing, calls are queued up on the switch, and the caller hears multiple rings because all ports are in use. The call is eventually answered if the caller does not hang up.

With switches that do not support queueing, calls are blocked when all ports are in use and the callers hear a busy tone.

GOS is expressed as a percentage of busy-hour calls that are delayed or blocked. For example, if the number of ports is sized so that only 2 of 100 calls might be delayed or blocked during the busy hour, the system is said to provide a P.02 GOS. If only 5 of 100 calls are likely to be delayed or blocked, the system provides a P.05 GOS. P.01 is a better GOS than P.05 and, therefore, requires more ports.

Common industry GOS for messaging servers are P.01, P.02, P.03, and P.05.

There is a trade-off between cost and GOS. The choice is a business decision based on several factors, including:

- An assessment of how critical the application is to the business
- An assessment of the cost of ports required to provide the required GOS

For more information, see [Grade of service](#) on page 381.

Estimating port requirements

Planners must make an accurate estimate of ports needed to provide an acceptable level of service to subscribers.

Ports are utilized when incoming calls are made to the system or when the system makes outgoing calls. Planners must estimate the traffic generated by the following call types:

- Calls made by subscribers and external callers during the busiest hour of the day
- Calls made by the system to support features that require outgoing calls

Calculating the busy-hour offered traffic

Most newer switches provide traffic statistic reports that provide an accurate picture of traffic patterns on the switch. When planners prepare for the implementation of a messaging system, they need to study a minimum of traffic data from 1 week to determine daily and hourly call volumes.

Standard traffic-engineering tables are used to determine the proper number of ports based on busy-hour offered traffic.

To calculate the busy-hour offered traffic, planners must know or estimate the following values:

- The average number of incoming and outgoing calls generated during the busy hour.
- The average hold time (AHT) or duration of a call.

AHT is usually expressed in seconds or minutes. The hold time must include call setup and tear-down time. Setup time starts from the moment a port is seized, that is, when ringing starts. Tear-down time is the time it takes for the port to be available to process another call after a caller hangs up or is disconnected by the server.

Busy-hour offered traffic = (Average number of incoming and outgoing calls during the busy hour) x (AHT in seconds) / 3600 Erlangs

[Table 101](#) is an example of busy-hour calculation.

Table 101: Example of busy-hour calculation

Calls generated during busy hour	1500
AHT of a call	45 seconds
Total busy-hour traffic	1,500 calls x 45 seconds = 67,500 call seconds 67,500/60 = 1,125 call minutes 67,500/3600 = 18.75 Erlangs 67,500/100 = 675 CCSs

To predict busy-hour traffic accurately, planners must collect reliable traffic data that reflects the calling patterns specific to an installation or application. If busy-hour calls are underestimated, the number of ports might not be sufficient to provide users with an acceptable level of service. If busy-hour calls are overestimated, the additional number of ports increases the cost of providing the service needlessly.

Estimating traffic generated by incoming and outgoing calls

Traffic generated by incoming and outgoing calls include traffic generated by:

- Incoming calls
 - Call Answer messages
 - Automated Attendant and Caller Applications

Port Sizing

- Incoming fax messages (Applicable only to Modular Messaging—MSS)
- Find Me - Caller
- Caller-requested Notify Me calls
- Subscribers using the TUI
- Record, for example, conference calls
- Outgoing calls
 - Outgoing fax messages (Applicable only to Modular Messaging—MSS)
 - Automated Attendant and Caller Applications, when transferring answered calls
The use of a port for an outgoing call during call transfers is integration dependent.
 - Call Me
 - MWI
The use of a port for an outgoing call for MWI is integration dependent.
 - Find Me - subscriber being called
 - Client Access through dual connect

Traffic estimation guidelines

Some guidelines to help planners estimate the traffic generated by incoming and outgoing calls include:

- To place an outgoing call, the MAS uses a port. The traffic generated by these features can significantly affect the GOS if this traffic is not included in the estimate of busy-hour offered traffic.

If outgoing call delivery traffic is managed so that the majority of it occurs outside the busy hour, the impact on busy-hour GOS is minimized. If a large amount of outgoing call traffic is expected during the busy hour, size a separate group of outgoing ports and dedicate them to applications that require outgoing calls.
- With some SWINs, such as T1, E1, SIP, and H.323 integration, features that require a call transfer use two ports on the same MAS. These features include:
 - Find Me. Whenever a Find Me call is made, two ports are used. One port is used for the incoming call, and one port is used for the outgoing call to the subscriber.
 - Automated Attendant and Caller Applications. Whenever Automated Attendant or a Caller Application transfers an answered call, two ports are used.

When such features are used often, a higher number of ports are required. Planners must take this into account when estimating the number of ports required.

- Calculation of port usage for MWI varies, depending on the SWIN that the Modular Messaging system and the switch support. For IP integrations, T1, E1, or DSE integrations, administrators must configure port groups for MWI.

When Modular Messaging uses Analog or DSE switch integration (SWIN) to integrate with an Avaya switch that supports Port Affinity, an increased number of ports must be allocated for MWI than with any other switch integration type or with any non-Avaya switch.

Port Affinity is a feature on Avaya switches that affects the way in which ports are used to handle MWI requests. Port Affinity necessitates that when an MWI lamp is lit on a subscriber's extension by a specific MAS port, the same port must be used to reset the MWI lamp. If a different port is used to reset the lamp, the lamp remains lit. This is a feature of MWI on Avaya switches when the MAS uses Analog or DSE SWINs.

- Port usage varies, depending on the medium used to retrieve messages. When subscribers use the TUI or telephone to retrieve messages, port usage is high. When subscribers use a computer to retrieve messages, port usage is low. For example:
 - From Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, or Modular Messaging Lotus Notes Client, if subscribers use a telephone to play or record messages, port usage is high.
 - From Modular Messaging Outlook Client, Modular Messaging Restricted Outlook Client, or Modular Messaging Lotus Notes Client, if subscribers use the local multimedia capabilities to play or record messages, port usage is low.
- When subscribers use Modular Messaging Web Client or the UCC Speech Access client to retrieve messages, Modular Messaging port usage is low.
- When subscribers use the TUI to retrieve e-mail messages, TTS resources are in use and the AHT of a call increases. With an increase in AHT, ports are busy for a longer time.

Total estimated port requirements

To size port requirements:

1. Calculate the total estimated traffic generated by incoming and outgoing calls
2. For the number of ports required for a given GOS, see the tables in [Grade of service](#) on page 381.
 - If the telephone system does not support queuing calls, see the calculations based on the Erlang B model.
 - If the telephone system supports queuing calls, see the calculations based on the Erlang C model.

A system planner needs to allow for a safety or growth factor of 5% to 15% when sizing the initial implementation.

Calculating the number of messaging application servers required

The number of slots available and the number of cards supported restricts the number of ports that an MAS supports.

For more information about the maximum number of cards that an MAS supports, see [Modular Messaging system capacities](#) on page 251.

Note:

Modular Messaging—MSS supports a maximum of five MAS units per VMD.
Modular Messaging—Exchange and Modular Messaging—Domino support a maximum of 10 MAS units per VMD.

To determine the correct, not the minimum, number of servers needed, consider the effects of the following factors:

- The VMD design. For more information, see [General rules for voice mail domains](#) on page 240.
- Switch configuration and integration. For more information, see [Switch integration and telephony protocols](#) on page 209.
- The number of PCI slots available and the number of ports on the voice card. For more information, see the MAS port capacities tables in [Modular Messaging system capacities](#) on page 251.
- Port usage patterns. For more information, see [Estimating traffic generated by incoming and outgoing calls](#) on page 339.
- MAS load balancing. For more information, see [Messaging application server load balancing](#) on page 350.

Examples of the number of MAS units recommended

The examples in this section show the number of MAS units recommended, depending on the integration type and number of voice ports.

For more information about integration types, see [Switch integration and telephony protocols](#) on page 209.

Modular Messaging—MSS using analog integration and S3500 MAS units

In this example, an organization has 5,500 subscribers.

- Recommended number of voice ports = 96
- Maximum number of cards supported per MAS = 2
- Number of ports per card = 12

- Number of ports per MAS = 24
- Number of MAS units recommended for 96 voice ports = 4

In this example, two voice cards can be installed on each MAS. However, to allow for future expansion, administrators might want to distribute the ports across five MAS units.

Modular Messaging—MSS using H.323 integration and S3500 MAS units

In this example, an organization has 4,000 subscribers, with a requirement of approximately 70 IP sessions.

- Maximum number of IP sessions per MAS = 30
- Number of IP sessions supported by 2 MAS units = 60
- Number of IP sessions supported by 3 MAS units = 90

In this example, administrators might want to distribute the IP sessions across three MAS units.

Modular Messaging—MSS (Aria TUI) using T1 QSIG integration and S3400 MAS units

In this example, an organization has 5,300 subscribers.

- Recommended number of voice ports = 92
- Maximum number of cards supported per MAS = 2
- Number of ports per voice card = 23
- Number of MAS units recommended for 92 voice ports = 2

In this example, four voice cards are required on each MAS.

Evaluating the additional load on the network and e-mail servers

Microsoft Exchange

IBM Lotus Domino

Implementing Modular Messaging results in the flow of voice data over the data network. This section provides the information required to calculate the additional network traffic generated by a Modular Messaging system.

This section provides guidelines for evaluating the additional network traffic when the message store is Microsoft Exchange or IBM Lotus Domino.

Note:

Customers must keep their systems within performance operating ranges prescribed by Microsoft and IBM Lotus. To support the extra load for voice messaging, Avaya requires that the CPU utilization is no more than 50%.

The calculation for additional network traffic is based on several factors, including:

Port Sizing

- Number of MAS units in the VMD
- Number of ports on each MAS
- Usage characteristics
- Voice encoding rate: 13 kilobits per second for GSM, 64 kilobits per second for G.711

Worst-case network load

Use the following formula to calculate the worst-case network load contributed by a VMD.

Worst-case network bandwidth:

GSM encoding: Number of MAS units in the VMD x Number of ports on each MAS x 13 kilobits per second

G.711 PCM encoding: Number of MAS units in the VMD x Number of ports on each MAS x 64 kilobits per second

For example, for a site with a VMD containing five MAS units, each with 24 ports, the worst-case network bandwidth is:

For GSM encoding, $5 \times 24 \times 13 = 1,560$ kilobits per second

For G.711 PCM encoding, $5 \times 24 \times 64 = 7,680$ kilobits per second

You must also apply a factor of 10% to allow for the overhead that is applicable to the network protocols and options that are in operation.

This calculation is based on the worst-case assumption that all ports are recording or playing voice data at the same time. This calculation estimates the total network traffic potentially added but does not indicate how many ports receive calls and how many ports make calls.

Note:

The worst-case network load calculation does not include burst rates caused by bursty message deliveries or bursty message playback.

Chapter 13: Other planning considerations

This chapter contains the following topics:

- [Planning for redundancy](#) on page 346
- [Messaging application server load balancing](#) on page 350
- [Calculating the message storage capacity](#) on page 360
- [Calculating the number of desktop users per voice mail domain](#) on page 367
- [Centralized Modular Messaging](#) on page 374

Planning for redundancy

When administrators plan a Modular Messaging implementation, Avaya recommends that they include redundancy.

Planning for redundancy includes:

- [Messaging application server redundancy](#)
- [Message Storage Server redundancy](#)

In addition, administrators must consider power redundancy. Avaya requires that all servers are connected to an Uninterruptible Power Supply (UPS) for power backup.

Messaging application server redundancy

Messaging application server (MAS) redundancy means that when an MAS in a multi-MAS voice mail domain (VMD) goes out of service, the system can continue to send and receive messages.

Use the following guidelines when planning for MAS redundancy:

- Install a balanced number of voice cards on each MAS to ensure that the voice ports are distributed evenly across MAS units in the VMD. Voice port distribution ensures that if one or more MAS units are out of service, an adequate number of voice ports are still available.

Note:

For more information about voice ports, see [Voice ports](#) on page 208.

- With Digital Set Emulation (DSE) or Q-Signaling (QSIG) telephony, ensure that incoming port groups for all MAS units are in the same hunt group. If incoming port groups are in different hunt groups, calls presented to a port group on an unavailable MAS might not be routed to another port on an available MAS.

Note:

For more information about hunt groups, see [Switch integration and telephony protocols](#) on page 209.

- With analog telephony, use wiring to enable a single extension on the switch to serve two MAS units. Thus, if one MAS is unavailable, calls from the switch extension can go to the other MAS.

Note:

When using wiring to enable two MAS units to be serviced by a single extension on the switch, ensure that only one MAS unit is allowed to make outgoing calls.

- For greater reliability, ensure that extension numbers for the port boards on the MAS are distributed over several switch boards.

N+1 server configuration for MAS redundancy

Modular Messaging offers redundancy of voice ports by an N+1 server configuration.

N+1 server configuration is the implementation of more than the minimum number of MASs recommended to increase availability and reliability. An N+1 server configuration can be implemented only if certain established maximum limits are not exceeded:

- A 144-port limit and a five MAS limit for Modular Messaging—Avaya MSS version
- A 10 MAS limit for Modular Messaging—Microsoft Exchange version and Modular Messaging—IBM Lotus Domino version

If the Tracing Service and the Offline Access Store are installed on machines other than an MAS, those machines do not count toward the MAS limit.

Added redundancy with N+1 server configuration

An N+1 server configuration provides redundancy for the following services:

- Inbound services
Call Answer, subscriber access, dual-connect for GUI access, Automated Attendant, Caller Applications, fax answer and transfer (Microsoft Exchange and IBM Lotus Domino message stores), and inbound fax receipt (Modular Messaging—Message Storage Server (MSS) only)
- Outbound services
Find Me (Dialogic Digital Set Emulation (DSE) integrations) and Automated Attendant transfers

Some Modular Messaging services are MAS dependent and could be affected if they are on the MAS that goes out of service:

- The Tracing Service (if the Tracing Service resides on an MAS)
- The Offline Call Answer Store server. An MAS will not offer offline access if it is unable to communicate with the Offline Call Answer Store server. This condition does not arise unless both the message store and the Offline Call Answer Store server are unavailable.
- Call Me and MWI are installed on a single MAS. If that MAS is not running, neither of these services will work.
- Find Me will not work for H.323 and QSIG integrations if the ports on the MAS that received the call do not support outcalling applications and if the ports on the remaining in-service MAS units do not support outcalling applications.

In such circumstances, Modular Messaging prompts the caller to leave a Call Answer message.

- Outbound fax (Modular Messaging—MSS only)

Subscribers can install the Fax Sender Server on more than one MAS in a voice mail domain. In such a case, reconfiguring the system to use a different MAS for fax sending before a planned outage becomes easier.

Distributing ports in an N+1 server configuration

In an N+1 server configuration, ports can be distributed in any of the following methods:

- Additional capacity (recommended)

More ports than are required for day-to-day use are deployed. Additional ports may be added to the N+1 MAS until the system limits on ports and MAS units are reached. The additional ports are used for normal operation and ensure that even when an MAS is not running, customers still have the number of ports they need to provide needed service levels.

- Spread

The port capacity of the voice mail domain remains unchanged even after implementing an additional MAS (N+1). The required number of ports is spread across all MAS units, including the N+1 MAS. If a server stops running, the system will have less capacity than normal but is still able to provide service.

Message Storage Server redundancy

If a message store becomes unavailable to MAS units, Modular Messaging continues to provide the following services:

- Call Answer
- Emergency retrieval of new Call Answer messages from the Modular Messaging telephone user interface (TUI)

For more information, see [Offline Messaging](#) on page 167.

Avaya MSS

Avaya advises customers that require MSS redundancy to consider implementing the high-availability configuration of the MSS (MSS—H).

The MSS—H with the S3500 hardware offers:

- Four redundant, hot-swappable chassis fans and two redundant, hot-swappable power supplies
- Four hot-swappable 72 gigabyte (GB) SCSI disk drives and RAID Level 5 for data redundancy
- Remote Maintenance Board (RMB). RMB connects to an analog line for alarm reporting and servicing. International versions require an external modem.

Note:

Avaya recommends the use of the MultiTech MT5634ZBA-V.92 modem for international versions.

The MSS—H with the S3400 hardware offers:

- Two redundant, hot-swappable chassis fans and two redundant, hot-swappable power supplies
- Three hot-swappable SCSI RAID drives with hardware RAID Level 5 data redundancy
- RMB. RMB connects to an analog line for alarm reporting and servicing; international versions require an external modem.

Note:

For sites that are outside the United States and Canada, an external modem is required in addition to the RMB.

The MSS provides backup capabilities that include backing up data to a digital versatile disc (DVD) Random Access Memory (RAM) drive or to a remote storage location on the LAN through Distributed Transaction Process (DTP) and Secure File Transfer Protocol (SFTP).

One DVD-RAM medium holds approximately 4.7 GB of data. If a system failure occurs, administrators can use the data stored on the media to restore the system to an operational state. For more information, see [Backup capabilities](#) on page 158.

Large configuration systems require the MSS-H to be implemented. [Table 102](#) provides information about when an MSS-H message store is required.

When a VMD has a mix of both S3500 and S3400 MAS servers, use the lower value to determine when an MSS—H is required.

Table 102: MSS—H message store required

Integration	S3500 server	S3400 server	S3400 server
	TUI: Any	TUI: Aria TUI only	TUI: AUDIX and Serenade, either independently or in combination with Aria TUI
Session Initiation Protocol (SIP)	More than 1 MAS	More than 2 MAS units	More than 2 MAS units
H.323	More than 2 MAS units	More than 2 MAS units	More than 2 MAS units
T1	More than 1 MAS	More than 1 MAS	More than 2 MAS units
E1	More than 1 MAS	More than 2 MAS units	More than 2 MAS units
DSE	More than 2 MAS units	More than 2 MAS units	More than 2 MAS units
12-port analog	More than 2 MAS units	More than 1 MAS	More than 2 MAS units

Note:

When a Microsoft Exchange server or an IBM Lotus Domino server is offline, Modular Messaging continues to provide offline messaging. For more information, see [Peer Failover](#) on page 170 and [Domino Clustering](#) on page 171.

Messaging application server load balancing

Modular Messaging services and components are installed on an MAS, unless otherwise recommended.

For Modular Messaging Release 3, these services are installed on each MAS in the VMD, but are enabled only on the MAS on which the service is configured to run.

In a multi-MAS VMD, Avaya recommends the following guidelines for the placement of services:

- Configure the Call Me Service and MWI Service along with Mailbox Monitor on the same MAS.
- For smaller systems, the following services and components reside on the same MAS:
 - Tracing Service
 - Call Me Service
 - MWI Service
 - Mailbox Monitor
 - Fax Sender Service (MSS only)
 - Offline Call Answer Store

For large systems, Avaya recommends installing these services on a separate computer, other than an MAS. This separate computer, known as a Supplementary Server, is either:

- an Avaya-provided S3400 or S3500 server that is purchased additionally, or
- a customer-provided computer that meets the requirements specified in [Supplementary Server requirements](#) on page 412

Note:
The separate computer recommended for installing the Modular Messaging services was known as Tracing Server in the previous releases of Modular Messaging.

[Table 103](#) provides information about the limits at which a Supplementary Server is required.

Table 103: Supplementary Server required

Integration type	S3500 server	Customer-provided hardware	S3400 server	
			Aria TUI only	AUDIX or Serenade TUI
SIP	More than 3 MAS units	More than 3 MAS units	More than 3 MAS units	More than 3 MAS units

Table 103: Supplementary Server required

H.323	More than 3 MAS units	More than 3 MAS units	More than 3 MAS units	More than 3 MAS units
T1 QSIG	More than 3 MAS units	More than 3 MAS units	More than 3 MAS units	More than 3 MAS units
E1 QSIG	More than 2 MAS units	More than 2 MAS units	More than 3 MAS units	More than 3 MAS units
DSE	NA	More than 3 MAS units	More than 3 MAS units	More than 3 MAS units
12-port Analog	NA	More than 3 MAS units	More than 3 MAS units	More than 3 MAS units

Note:

If customers purchase a Supplementary Server, Avaya recommends hosting Offline Call Answer Store and Administration Clients also on this same server.

Recommended placement of server components

[Table 104](#) provides information about the recommended placement of services and components for Modular Messaging with the S3500 hardware.

Note:

Call Me Service and MWI Service are coresident with Mailbox Monitor.

Table 104: Recommended placement for Modular Messaging with S3500 hardware

Number of MAS units	SWIN and TUI	MAS no. 1 ¹	MAS no. 2	MAS no. 3	MAS no. 4 to 10 ²	Supplementary Server
1	Any	Tracing Service Call Me Service MWI Service Mailbox Monitor Service Fax Sender Service No Offline Call Answer Store is required Web Subscriber Options (if the Modular Messaging system has less than 500 subscribers)	NA	NA	NA	NA
2	Any	Call Me Service MWI Service Mailbox Monitor Service Web Subscriber Options (if the Modular Messaging system has less than 500 subscribers)	Tracing Service Fax Sender Service Offline Call Answer Store	NA	NA	NA

Table 104: Recommended placement for Modular Messaging with S3500 hardware (continued)

Number of MAS units	SWIN and TUI	MAS no. 1 ¹	MAS no. 2	MAS no. 3	MAS no. 4 to 10 ²	Supplementary Server
3 ³	Any	Fax Sender Service ⁴	Call Me Service MWI Service Mailbox Monitor Service	Tracing Service Offline Call Answer Store	NA	NA
4 ³ to 10 ²	SIP H.323 T1 QSIG E1 QSIG	NA	NA	NA	NA	Tracing Service Call Me Service MWI Service Mailbox Monitor Service Fax Sender Service Offline Call Answer Store Admin Tools
4 ³ to 10 ²	Analog DSE	Fax Sender Service ⁴	Call Me Service MWI Service Mailbox Monitor	Tracing Service	Offline Call Answer Store	NA

1. This MAS must have the smallest number of ports.

2. Modular Messaging—MSS supports a maximum of five MAS units in a VMD.

3. Modular Messaging systems with more than 500 subscribers must have Web Subscriber Options installed on a separate standalone server.

4. Fax Sender service is available only for the Modular Messaging—MSS configuration. Fax Sender is currently unavailable for the H.323 and SIP integrations.

Other planning considerations

[Table 105](#) provides information about the recommended placement of services and components for Modular Messaging with the S3400 hardware.

Note:

Call Me Service and MWI Service are coresident with Mailbox Monitor.

Table 105: Recommended placement for Modular Messaging with S3400 hardware

Number of MAS units	SWIN and TUI	MAS no. 1 ¹	MAS no. 2	MAS no. 3	MAS no. 4 to 10 ²	Supplementary server
1	Any	Tracing Service Call Me Service MWI Service Mailbox Monitor Service Fax Sender Service No Offline Call Answer Store is required Web Subscriber Options (if the Modular Messaging system has less than 500 subscribers)	NA	NA	NA	NA
2	T1 QSIG E1 QSIG (Aria TUI)	Web Subscriber Options (if the Modular Messaging system has less than 500 subscribers)	NA	NA	NA	Tracing Service Call Me Service MWI Service Mailbox Monitor Service Fax Sender Service Offline Call Answer Store Admin Tools

Table 105: Recommended placement for Modular Messaging with S3400 hardware (continued)

Number of MAS units	SWIN and TUI	MAS no. 1 ¹	MAS no. 2	MAS no. 3	MAS no. 4 to 10 ²	Supplementary server
2	SIP H.323 Analog DSE (Any TUI) T1 QSIG E1 QSIG (AUDIX and Serenade TUIs)	Call Me Service MWI Service Mailbox Monitor Service Web Subscriber Options (if the Modular Messaging system has less than 500 subscribers)	Tracing Service Fax Sender Service Offline Call Answer Store	NA	NA	NA
3 ³	T1 QSIG E1 QSIG (Aria TUI)	NA	NA	NA	NA	Tracing Service Call Me Service MWI Service Mailbox Monitor Service Fax Sender Service Offline Call Answer Store Admin Tools
3 ³	SIP H.323 Analog DSE (Any TUI) T1 QSIG E1 QSIG (AUDIX and Serenade TUIs)	Fax Sender Service	Call Me Service MWI Service Mailbox Monitor Service	Tracing Service Offline Call Answer Store	NA	NA
4 ³ to 10 ²	Any	NA	NA	NA	NA	Tracing Service Call Me Service MWI Service Mailbox Monitor Service Fax Sender Service Offline Call Answer Store Admin Tools

1. This MAS must have the smallest number of ports.

2. Modular Messaging—MSS supports a maximum of five MAS units in a VMD.

3. Modular Messaging systems with more than 500 subscribers must have Web Subscriber Options installed on a separate standalone server.

Recommendations for Offline Call Answer Store

Modular Messaging provides Call Answer services to callers that cannot reach subscribers. Callers can use these Call Answer services to leave voice or fax messages for subscribers.

Modular Messaging continues to provide Call Answer services to callers, even when a message store cannot be accessed. This feature is known as Offline Call Answer. In addition, Modular Messaging provides subscribers with emergency access to these offline Call Answer messages from the Common Offline Access interface. For more information, see [Offline Call Answer](#) on page 168.

The MAS caches all Call Answer messages that it receives in a local message store. In a multi-MAS VMD, each MAS migrates copies of Call Answer messages in its local offline message store to a common repository. This repository, known as Offline Call Answer Store, contains copies of messages from all MAS units in a VMD.

Offline Call Answer Store is a single repository for Call Answer messages taken for all subscribers in the VMD, in the last x number of hours. The value of x is 24 by default but can be changed to any value from 1 to 99.

Offline Call Answer Store can reside on any one of the following computers:

- An MAS

Offline Call Answer Store can reside on an MAS that can store up to 5,000 hours of GSM-encoded messages, that is, 1,000 hours of G.711-encoded messages. This storage space is used by Call Answer messages in the local store and Call Answer messages in Offline Call Answer Store.

- A Supplementary Server

The Supplementary Server can be an Avaya S3400 or S3500 server, an auto-configured Avaya Store Supplementary Server, an auto-configured Exchange Supplementary Server, or a customer-provided computer that meets the requirements specified in [Supplementary Server requirements](#) on page 412.

Note:

An auto-configured Avaya Store Supplementary Server can be used only with a Modular Messaging—MSS system. Similarly, an auto-configured Exchange Supplementary Server can be used only with a Modular Messaging—Exchange system.

An Avaya server on which the Modular Messaging software has not been installed provides up to 10,000 hours of GSM-encoded messages or 2,000 hours of G.711-encoded messages. This capacity is sufficient to store one copy of Call Answer messages from each MAS in the VMD. The Supplementary Server must be on the customer's LAN with Modular

Messaging—Exchange. With Modular Messaging—MSS, this system must be on the private LAN that connects the MAS units with the MSS.

If customers purchase a Supplementary Server for Offline Call Answer Store, Avaya recommends installing the following services also on this system:

- Tracing Service
- Call Me Service and MWI Service, with Mailbox Monitor
- Fax Sender Service

Avaya recommends that Modular Messaging administration clients be run from this system because of their intensive resource requirements.

Note:

Modular Messaging Release 1.1 and Release 3 do not support configurations with Offline Call Answer Store on a MAN or WAN.

Calculating the number of hours for message storage

To calculate the number of hours required for Offline Call Answer Store to store messages, planners must have these details:

- Total number of mailboxes on the system. (M)
- Total number of voice and fax Call Answer messages received daily per subscriber. The default is 5. (nCA)
- Average length of voice and fax Call Answer messages, in seconds. The default is 30. (L)
- Number of MAS units in the VMD. (nMAS)
- Retention time, in hours, for offline Call Answer messages. The default is 24 but can be changed to any value from 1 to 99. (HRS)
- Message encoding format: GSM 6.10 or G.711

The rules for calculating the hours of storage are:

- Hours required for 24-hour period (24HRS): $(M \times nCA \times L)/3600$
- Hours required for n hour periods (nHRS): $24HRS \times nHRS/24$

The calculations for evaluating whether Offline Call Answer Store must be located on an MAS or on the Supplementary Server are:

- An MAS can host Offline Call Answer Store if the MAS meets the following criteria:
 $nHRS + (nHRS/nMAS) \leq 5,000$ (GSM) or 1,000 (G.711)
- A Supplementary Server can host Offline Call Answer Store if the server meets the following criteria:
 $nHRS \leq 10,000$ (GSM) or 2,000 (G.711)

Other planning considerations

Note:

The maximum number of hours available on an MAS is 5,000 (GSM) or 1,000 (G.711). The maximum number of hours available on the Supplementary Server not configured as an MAS is 10,000 (GSM) or 2,000 (G.711).

Example of Offline Call Answer Store message storage

[Table 106](#) provides an example for calculating the requirements for storing offline Call Answer messages.

Table 106: Server capacities and requirements for Offline Call Answer message storage

Input	Value
Number of seats or mailboxes (M)	5,000
Average number of incoming Call Answer messages per seat in a 24-hour period (nCA)	5
Average length of messages, in seconds (L)	30
Number of MAS units in configuration (nMAS)	2
Number of hours of storage required (HRS)	24
Message encoding format	GSM
Hours of storage	
Hours of storage required for 24-hour period (24HRS)	$(M \times nCA \times L)/3600 = 208$
Total hours of storage for n hour periods (nHRS)	$24HRS \times HRS/24 = 208$
On-board evaluation (located on one of the MAS units)	
Total on-board hours (copy for all MAS units plus local MAS copy)	$nHRS + (nHRS/nMAS) = 313$
On-board MAS is OK or not OK Maximum 5,000 GSM/1,000 G.711	Is OK
Off-board evaluation (On Supplementary Server)	
Total off-board hours (copy of all MAS units)	$nHRS = 208$
Off-board S3400, assuming 60 GB available, is OK or not OK Maximum 10,000 GSM/2,000 G.711 hours	Is OK

Hunt algorithm

While planning load balancing across MAS units, consider the hunt algorithm that the telephone system uses.

Since the hunt group consists of ports spread across multiple MAS units, calls should be distributed as equally as possible among all the MAS units. Hunt algorithms that distribute calls evenly across all ports are the most desirable. Avoid algorithms that hunt from either the top or bottom of the hunt group because they tend to load the MAS units unevenly.

If the telephone system does not offer a desirable algorithm, one alternative is to set up the hunt group so that ports alternate between MAS units.

**Tip:**

Customers that use the Find Me feature extensively can consider excluding Find Me ports from the hunt group.

Note:

The hunt group can also be configured to provide even distribution of traffic to cards within servers.

Calculating the message storage capacity

Modular Messaging supports the GSM and G.711 encoding formats.

[Table 107](#) shows the storage spaces required to encode voice messages using the GSM and G.711 formats.

Table 107: Encoding rates and storage space

Encoding rate	GSM	G.711
Voice messages		
Bytes per second (Bps)	1,625	8,000
Kilobytes per second (KBps)	1.58	7.81
Kilobytes per minute (KB per minute)	95.2	468.8
Megabytes per hour (MB per hour)	5.6	27.5
Fax messages		
Kilobytes per page (subject to coverage, quality, file format)	80	80

Note:

These calculations use the following definitions:

1024 bytes = 1 KB

1024 KB = 1 MB

Storage space available on message application server

The maximum hours available on the MAS for storage of Call Answer messages are:

- For GSM storage: 5,000 hours
- For G.711 storage: 1,000 hours

Note:

These values are estimated maximum values and are not guaranteed. The storage capacity might be reduced by the use of other files, such as log files.

The hours of storage for offline Call Answer message storage are used when the message store is unavailable.

Storage space available on the Message Storage Server

Avaya MSS

Modular Messaging supports the GSM, G.711 A-law, and G.711 μ -law encoding formats.

An MAS can play and record the GSM, G.711 A-law, and G.711 μ -law audio encoding formats. The single format specified by the VMD setting refers to the format used to record voice messages, recorded names, and greetings by the TUI and graphical user interface (GUI) clients.

The MSS can support both encoding formats simultaneously, as the MSS might receive messages from remote subscribers in any supported format.

The G.711 encoding format consumes approximately five times as much storage space as the GSM format. However, the G.711 format provides better sound quality and also provides Teletypewriter (TTY) support.

The maximum hours of storage available on an MSS are:

- GSM
 - MSS—S: 7,500
 - MSS—H: 15,000
- G.711
 - MSS—S: 1,500
 - MSS—H: 3,000

Note:

These calculations include the 20% free space that must be available on the MSS for the system to run.

All storage on the MSS is made available to the customer. Thus there is no need to purchase additional storage.

Calculating the storage space on e-mail servers

Microsoft Exchange

IBM Lotus Domino

Administrators of the e-mail environment usually define a maximum amount of space that each subscriber is entitled to have on the corporate e-mail system. If voice and fax messages are going to be added to the e-mail message store, this needs to be accounted for.

Subscribers must be able to operate within existing allocations or be granted incremental space as required.

Other planning considerations

The amount of additional storage space required for voice and fax messaging on Microsoft Exchange or IBM Lotus Domino e-mail servers depends on several factors, including:

- Average number of Call Answer messages sent and received per day
- Average duration of Call Answer messages
- Average number of voice messages sent and received per day
- Average duration of voice messages
- Average number of fax messages sent and received per day
- Average length and size of fax messages
- Average retention period for storage of messages
- Number of subscribers in the organization
- Average retention period for storage of messages

Example of e-mail server storage capacity calculation

To calculate the impact that voice messages will have on the current e-mail store based on which encoding algorithm is being used, consider the example shown in [Table 108](#).

Table 108: Storage capacity calculation example

Assumption per subscriber		GSM encoding	G.711 encoding
Voice and Call Answer messages			
Total number of voice and Call Answer messages sent and received per day	6	—	—
Average length (seconds)	40	—	—
Size (KBps)	—	1.58	7.81
Space required for storage of new messages (MB)	—	0.370	1.830
Fax messages			
Total number of fax messages sent and received per day	0.075	—	—
Average length of fax (pages)	3	—	—
Size in KB per page (subject to coverage, quality, file format)	80	—	—
Space required for storage of new fax messages (MB)	—	0.018	0.018

Table 108: Storage capacity calculation example (continued)

Assumption per subscriber		GSM encoding	G.711 encoding
Total storage requirements			
Total daily storage (MB)	—	0.388	1.848
Average retention period (days)	10	—	—
Total message store requirement (MB)	—	3.88	18.48
E-mail storage allocation			
Current e-mail storage allocation per subscriber (MB)	50	—	—
Percentage of current e-mail allocation for voice mail	—	7.76	36.96

Storage planning

[Table 109](#) provides a calculator for storage planning.

Table 109: Storage planning

	Assumption	GSM	G.711
Assumptions per subscriber			
Subscribers	5,000	—	—
Call Answer messages per day	4	—	—
Average duration of Call Answer messages	30 seconds	47 KB	234 KB
Fax messages per day	0.05	—	—
Length of fax messages	3 pages	240 KB	240 KB
Local messages sent	1	—	—
Network messages sent	0.04	—	—
Local messages received	1	—	—
Network messages received	0.06	—	—
Average message length	60	95 KB	469 KB
Average retention period	2 days	—	—

Table 109: Storage planning (continued)

	Assumption	GSM	G.711
Message Store (1=MSS, 0 = E-mail)	1	—	—
Subscriber summary			
Total voice or Call Answer messages per day (sent or received)	6.1	—	—
Weighted average length of messages	40.3 seconds	—	—
MAS requirements			
MAS requirement	167 hours	—	—
Fax	750 pages	—	—
MAS requirement	—	1,035 MB	4,800 MB
Number of MAS units	—	Needs to be calculated	
Offline access requirements			
Retention period	48 hours	—	—
Offline Call Answer Store Assumes equal distribution of messages over period	—	1,987 MB	9,167 MB
Message Store requirements			
Message Store requirement Assumes each recipient is charged with space	683.3 hours	—	—
Fax	750 pages	—	—
Message Store requirement	—	3,887 MB	18,792 MB
Planning for Unified Message store			
Total MB per user for voice and fax messaging	—	0.777	3.758
Current e-mail storage allocation per user	50 MB	—	—
Percentage of current allocation for voice mail	—	1.55%	7.5%

Fax port and storage planning

Planners can use the calculator provided in [Table 110](#) for fax port and storage planning.

Table 110: Fax port and storage planning

Planning assumptions			
Number of subscribers	500	—	
Average length of fax messages	3 pages		
Page coverage	80%		
Storage format	.tif		
Fax per day per heavy user	0.75 faxes		
Percentage of heavy users	10%		
Fax per day per user	0.075 faxes		
Retention time	2 days		
Percentage of busy hour	14%		
	Standard	Fine	Average
Mix	50%	50%	100%
Storage per page	40.0 KB	80.0	60.0
Port utilization per page	40.0 seconds	70.0	55.0
Storage			
Per fax	120.0 KB	240.0	180.0
Per user per day	9.0 KB	18.0	13.5
Per user base per day	4.5 MB	9.0	6.8
Retention	9.0 MB	18.0	13.5
Port utilization			
Per fax	120.0 seconds	210	165.0
Per user per day	9.0 seconds	15.8	12.4
Per user base per day	4,500.0 seconds	7,875.0	6,187.5
Per user base per busy hour	630.0 seconds	1,102.5	866.3

Table 110: Fax port and storage planning

Per user base per busy hour	6.3 CCS	11.0	8.7
Per user base per busy hour	0.2 Erlangs	0.3	0.2

Message retention estimate

To calculate the message retention estimate, planners need the following information:

- Percentage of daily messages retained (A)
- Maximum retention limit (B)
- Average retention time relative to retention limit (C)

The calculations for message retention estimate are:

- Average retention time for retained messages (D): $[B \times C]$
- Average retention for all messages; includes 1-day cycle time for daily messages not retained: $[1 \times A + D \times (1-A)]$

[Table 111](#) provides an example for calculating the message retention estimate.

Table 111: Message retention estimate calculation

Planning inputs	Value
Percentage of daily messages retained	0.55 %
Maximum retention limit	20 days
Average retention time relative to retention limit	0.4 days
Calculation	
Average retention time for retained messages	$[20 \times 0.4]$ 8 days
Average retention for all messages (includes 1-day cycle time for daily messages not retained)	$[1 \times 0.55 + 8 \times (1-0.55)]$ 4.15 days

Calculating the number of desktop users per voice mail domain

A Modular Messaging—Exchange or Modular Messaging—Domino configuration supports up to a maximum of 100,000 local subscribers in a VMD. The customer implementation of the e-mail environment determines the number of desktop users.

System message notification (MWI, Call Me, or Notify Me) is limited to 12,000 subscribers for Modular Messaging—Exchange and 1,200 subscribers for Modular Messaging—Domino, within a VMD. Subscribers that are not enabled for system message notification can rely on the notification mechanisms provided by the GUI clients for being notified of new messages.

Modular Messaging—MSS supports two types of standards-based e-mail clients:

- E-mail clients based on IMAP4 standards, known as IMAP4 clients
- E-mail clients based on POP3 standards, known as POP3 clients

The Modular Messaging recommendations show the number of ports that are required to provide service to a given number of subscriber mailboxes. The number of mailboxes is based on port calculations alone. The number of IMAP4 and POP3 clients that Modular Messaging supports is limited by the maximum number of sessions supported.

In addition to the GUI clients, Modular Messaging—MSS also supports two types of Web clients:

- Modular Messaging Web Client
- Web Subscriber Options

The Modular Messaging Web Client allows subscribers to access, send, and manage voice, text, fax, and corporate e-mail messages from a Web browser. Modular Messaging Web Client uses IMAP4 client connections to communicate with Modular Messaging—MSS.

The Web Subscriber Options application allows subscribers to modify their mailbox settings from a Web browser.

IMAP4 client limits

Avaya MSS

With a Modular Messaging—MSS system, all active IMAP4 clients require an IMAP4 session on the Avaya MSS.

Currently, Modular Messaging—MSS—H and Modular Messaging—MSS—S, with the S3500 hardware supports up to 2,500 simultaneous IMAP4 connections to an MSS.

Modular Messaging—MSS—H and Modular Messaging—MSS—S, with the S3400 hardware support up to 1,000 simultaneous IMAP4 connections to an MSS.

Applications that affect client limits

The applications that count toward the limit of simultaneous connections include:

- Modular Messaging Outlook Client
- Modular Messaging Restricted Outlook Client (applicable only to Modular Messaging—MSS)
- Modular Messaging Lotus Notes Client
- Modular Messaging Web Client
- Unified Communication Center (UCC) Speech Access
- Standard e-mail clients that use the IMAP4 protocol, such as Outlook Express

Note:

Subscribers might also be using UCC Speech Access and an IMAP4 e-mail client simultaneously.

Some clients use two IMAP4 sessions per connection, based on the way that the client applications have implemented the IMAP4 standard. These clients include Microsoft Outlook Express, Microsoft Outlook (with or without Modular Messaging Outlook Client), and Lotus Notes without Modular Messaging Lotus Notes Client.

When clients that require two IMAP4 sessions are in use, Modular Messaging supports a reduced number of users. A client, such as Modular Messaging Outlook Client, only requires the second IMAP4 session when sending a message. It can be assumed that at a given time 10% of Outlook Clients require two sessions and 90% require one session, reducing a limit of 2,500 IMAP4 sessions to 2,250.

Inactive IMAP4 clients are timed out by the server after 30 minutes. However, clients that check for new messages at a periodic interval of less than approximately 30 minutes are never timed out.

Calculating IMAP4 client limits

Use the following rule for calculating IMAP4 client limits:

$(\text{User population} \times [\% \text{ given IMAP4 access}] \times [\% \text{ logged in at one time}]) \leq 2,500 \text{ (S3500) or } 1,000 \text{ (S3400)}$

To determine the IMAP4 requirement for a single MSS VMD, planners must calculate the estimated simultaneous IMAP4 users.

For example, if the total user population is 1,750 and the percentage of users with IMAP4 access is 50%, the total number of IMAP4 users is 875. If the percentage of IMAP4 users simultaneously logged in is 80%, the estimated simultaneous IMAP4 requirement is 700.

Note:

The number of users with IMAP4 access depends on customer deployment and usage patterns.

Note:

A single Web server for Modular Messaging Web Client can support 1,000 Web Client connections. A VMD can use multiple Web servers. However, the total number of Web Client connections is subject to the MSS limit of 2,500 simultaneous IMAP4 client connections.

POP3 client limits

Avaya MSS

POP3 clients perform background polling to check for new messages every few minutes. This polling is CPU intensive and limits the number of POP3 clients that can be configured on a Modular Messaging—MSS system.

[Table 112](#) provides information about the POP3 client limits with Modular Messaging Release 3.

Table 112: POP3 client limits

POP3 client sessions	On S3500 hardware	On S3400 hardware
<ul style="list-style-type: none">Maximum number of clients, clients poll every 2 minutesMaximum number of clients, clients poll every 10 minutes¹Maximum number of active client sessions	2,500 5,000 80	1,000 5,000 24

1. More than 5,000 simultaneous sessions affects system performance.

Modular Messaging Web Client limits

Avaya MSS

The Modular Messaging Web Client requires a standalone computer as a Web server that hosts the Web content. However, Web Client cannot be installed on a Supplementary Server.

Only one instance of Modular Messaging Web Client can exist on a Web server. Other MAS applications or services must not be installed on the Web server of Modular Messaging Web Client. However, Web Subscriber Options can be installed on the Web server of Modular Messaging Web Client. A Web server of Modular Messaging Web Client can support up to 1000 Modular Messaging Web Client connections.

Multiple Web servers of Modular Messaging Web Client can exist on a VMD. However, the maximum number of simultaneous Modular Messaging Web Client connections depends on the number of simultaneous IMAP4 connections supported for the Modular Messaging—MSS system. For information on the IMAP4 connection limits, see [IMAP4 client limits](#) on page 367.

Web Subscriber Options

You can use a standalone computer, an MAS of a Modular Messaging system with less than 500 subscribers, or the Web server of Modular Messaging Web Client as the Web server of Web Subscriber Options.

Only one instance of Web Subscriber Options can exist on a Web server. Modular Messaging Web Client can be installed on the Web server of Web Subscriber Options. Other MAS applications or services can also be installed on the Web server of Web Subscriber Options. However, if Modular Messaging Web Client installed on the Web server of Web Subscriber Options, other MAS applications or services cannot be installed.

Multiple Web servers of Web Subscriber Options can exist on a VMD. If Web Subscriber Options is installed on an MAS, 100 subscribers can be logged in to Web Subscriber Options at any given time. Five subscribers, of the 100 subscribers logged in to the application, can simultaneously use Web Subscriber Options.

If Web Subscriber Options is installed on a standalone computer, 1500 subscribers can be logged in to Web Subscriber Options at any given time. 60 subscribers, of the 1500 subscribers logged in to the application, can simultaneously use Web Subscriber Options. If Web Subscriber Options is installed on the Web server of Modular Messaging Web Client, 1500 subscribers can be logged in to either Web Subscriber Options or Modular Messaging Web Client.

Planning for port requirement

Avaya MSS

[Table 113](#) provides an example for planning port requirements of a Modular Messaging system.

Table 113: Modular Messaging—MSS port requirements planning

Feature using ports	Average hold time (AHT)	Percent capable	Frequency per day per user	Percent busy hour	Seconds per day	Erlangs	CCS
Per subscriber							
Call Answer	35	100	2.000	14.0	70.00	0.02	0.70
Fax Answer	5	100	0.050	14.0	0.25	0.00	0.00
Fax inbound	120	100	0.050	14.0	6.00	0.00	0.06
Fax outbound	120	100	0.025	14.0	3.00	0.00	0.03
Automated Attendant	20	100	3.000	14.0	60.00	0.02	0.60
Caller Application 1	60	100	0.250	10.0	15.00	0.00	0.15
Caller Application 2	30	100	2.000	14.0	60.00	0.02	0.60
Caller Application 3	120	100	0.100	10.0	12.00	0.00	0.12
Call Me	180	20	2.000	5.0	72.00	0.02	0.72
Find Me - calling party	120	10	6.000	5.0	72.00	0.02	0.72
Find Me - called party	300	10	3.000	5.0	90.00	0.03	0.90
TUI access	180	100	3.000	14.0	540.00	0.15	5.40
Client access/dual connect	60	30	3.000	14.0	54.00	0.02	0.54
Record ¹	2,700	100	0.001	10.0	2.70	0.00	0.03
Total per day	—	—	—	—	1,056.95	0.29	10.57
Total per busy hour	—	—	—	11.9	125.73	0.03	1.26
Per system (5,000 subscribers)							
Total per day	—	—	—	—	5,284,750	1,467.99	52,847.50
Total per day busy hour	—	—	—	—	628,625	174.62	6,286.25

1. For example, conference calls.

Microsoft Exchange

IBM Lotus Domino

Table 114 provides an example for planning port requirements of a Modular Messaging system.

Table 114: Modular Messaging (Exchange or Domino) port requirements planning

Feature using ports	AHT	Percent capable	Frequency per day per user	Percent busy hour	Seconds per day	Erlangs	CCS
Per Subscriber							
Call Answer	35	100	2.000	14.0	70.00	0.02	0.70
Fax Answer	5	100	0.050	14.0	0.25	0.00	0.00
Fax inbound	0	100	0.000	14.0	0.00	0.00	0.00
Fax outbound	0	100	0.000	14.0	0.00	0.00	0.00
Automated Attendant	20	100	3.000	14.0	60.00	0.02	0.60
Caller Application 1	60	100	0.250	10.0	15.00	0.00	0.15
Caller Application 2	30	100	2.000	14.0	60.00	0.02	0.60
Caller Application 3	120	100	0.100	10.0	12.00	0.00	0.12
Call Me	180	20	3.000	5.0	108.00	0.03	1.08
Find Me - calling party	120	10	6.000	5.0	72.00	0.02	0.72
Find Me - called party	300	10	3.000	5.0	90.00	0.03	0.90
TUI access	360	100	2.000	14.0	720.00	0.20	7.20
Client access/dual connect	60	60	3.000	14.0	108.00	0.03	1.08
Record ¹	2,700	100	0.001	10.0	2.70	0.00	0.03
Total per day	—	—	—	—	1,317.95	0.37	13.18
Total per busy hour	—	—	—	12.1	159.03	0.04	1.59
Per system (5,000 subscribers)							
Total per day	—	—	—	—	6,589,750.00	1,830.49	65,897.50
Total per day busy hour	—	—	—	—	795,125.00	220.87	7,951.25

1. For example, conference calls.

Centralized Modular Messaging

Centralized voice messaging allows an enterprise to consolidate resources and ensure uniform messaging services to its employees in various locations. With centralized messaging, an enterprise can provide messaging services by managing fewer messaging systems rather than operating separate messaging systems at different geographic locations.

The scalability of Avaya Modular Messaging makes it an ideal solution to support the deployment of centralized messaging. For more information, see [Scalability](#) on page 31.

The benefits of centralized messaging include:

- Reduced administrative costs: Server consolidation can reduce administrative costs by reducing the number of physical servers that must be managed.
- Larger systems provide better economies of scale that lower acquisition and maintenance costs.
- Consistent messaging services: When an enterprise extends centralized service to all its members, a consistent set of capabilities is provided to each employee, regardless of the employee's geography. This ensures that all members of the organization benefit from these business applications, and training and support to associates can be standardized.

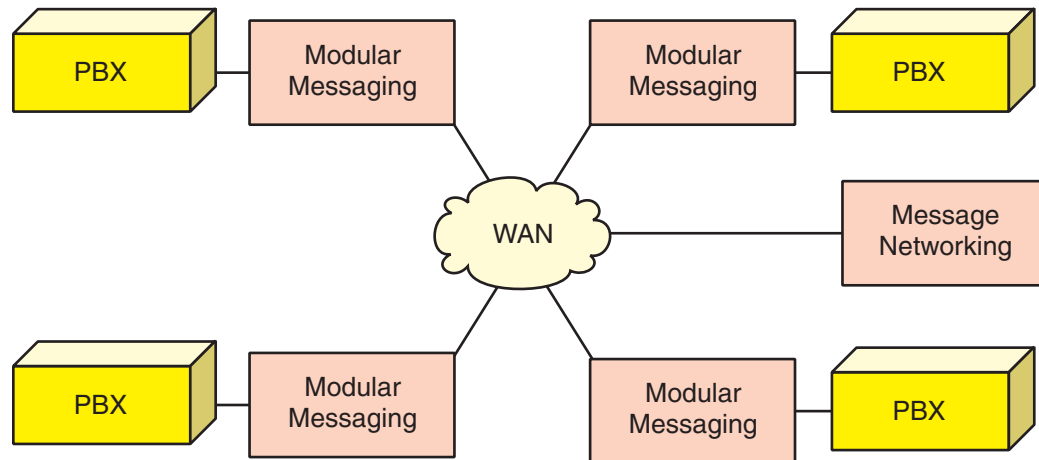
Note:

For more information, see Benefits and Considerations of Centralized Messaging White Paper, available in the Resource Type White Papers library on the Avaya Web site at www.avaya.com.

Topologies

Avaya provides several network topologies to support centralized messaging with Modular Messaging.

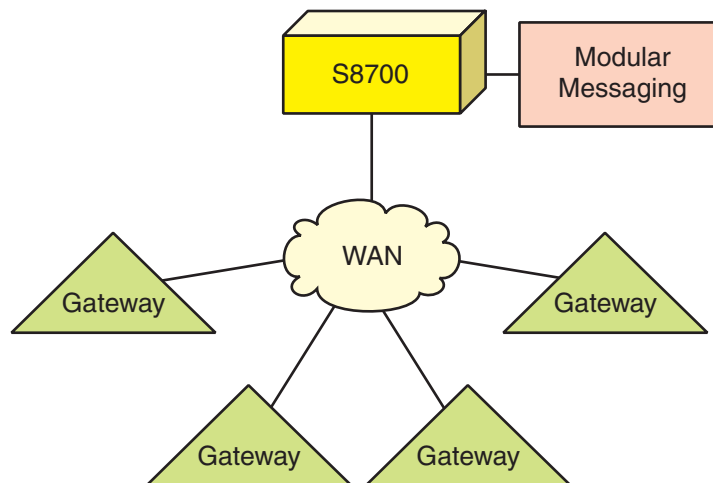
In a distributed topology, a messaging system is colocated with each private branch exchange (PBX). Modular Messaging systems can network directly to each other. To network with traditional voice messaging systems, Modular Messaging uses Avaya Message Networking. Message Networking might also be used to provide hub and spoke networking to reduce network administration and to act as a directory concentrator for all messaging systems.

Figure 3: Distributed Messaging

cymmdism LAO 102405

As customers move toward IP Telephony, they can use Avaya Communication Manager to deploy communication servers at a primary location. These communication servers provide services across the network to gateways at remote locations. These gateways, in turn, provide telephony services to users at those locations.

Modular Messaging can be integrated with the Avaya S87xx Media Server, which in turn can provide voice messaging services for any user on the system.

Figure 4: Centralized messaging with Modular Messaging and Avaya Communication Manager

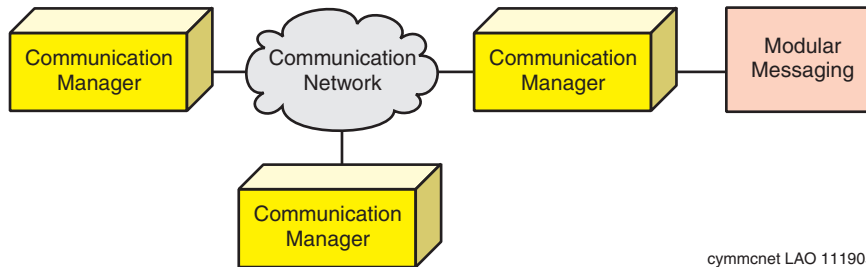
cymmcman LAO 111805

By networking individual switches together, Modular Messaging can provide voice messaging services to users on multiple communication servers, each of which may be supporting its own network of gateways. With Avaya Communication Manager, the switches can use QSIG as the

Other planning considerations

signaling protocol and be connected using IP, T1, E1, or SBS trunks. Alternatively, Avaya Communication Manager can also be networked through DCS+ or DCS.

Figure 5: Server to server networking



cymmonet LAO 111905

Considerations when implementing centralized Modular Messaging

When planners and customers implement centralized Modular Messaging, Avaya advises considering the factors described in this section.

Voice messaging and e-mail capacity - When customers consolidate their systems from distributed to centralized, the single system must meet the capacity requirements that were previously met with a series of independent systems.

With Modular Messaging—MSS, a single VMD can support up to 144 ports, 20,000 mailboxes, 15,000 hours of storage with GSM encoding, and 3,000 hours of storage with G.711 encoding.

Modular Messaging with Microsoft Exchange or IBM Lotus Domino message stores support up to 240 ports and 100,000 mailboxes in a single VMD.

When additional integration cards are added to the system or IP channels are required, up to five MAS units can be configured to service the VMD.

Modular Messaging—MSS supports up to 2,500 IMAP4 and POP3 clients that poll at an interval of 2 minutes or more and require only one IMAP4 or POP3 connection for the client session.

Thus, Modular Messaging is ideally suited for a centralized messaging solution.

Messaging network - To extend centralized messaging services to an entire enterprise, Modular Messaging can be networked with traditional voice messaging systems through Message Networking. Modular Messaging can exchange messages directly with other Modular Messaging via SMTP/MIME.

Voice mail integration features - With centralized Modular Messaging, voice mail features that are a function of switch integration work across the network. These features include MWI, covering extension, call information, and Find Me. This also includes features that are unique to Avaya Communication Manager, such as Transfer to Messaging.

Reliability - Required steps to ensure reliability of a centralized Modular Messaging system include:

- Utilization of the MSS—H. For more information, see [Message Storage Server redundancy](#) on page 348.
- Implementation of N+1 core application redundancy with Avaya Communication Manager. For more information, see [N+1 server configuration for MAS redundancy](#) on page 347.
- Implementation of Tracing Service on a Supplementary Server.
- Use of an uninterruptible power supply (UPS).
- Installation of virus protection software.
- Management of Microsoft patch updates and security hot fixes as noted on the Avaya Support Web site at <http://www.avaya.com/support>.

Mailbox administration - Mailbox administration can be performed using the MSS Web administration pages, Avaya Site Administration or Avaya Multi-Site Administration, or Mailbox Manager. Large systems, or those that require regional administrators, might require multiple administrators to access the system simultaneously.

GUIs - Subscribers can use desktop applications, such as Subscriber Options and Web Subscriber Options to configure their mailboxes. For managing messages, subscribers can use applications such as:

- Modular Messaging Outlook Client. Works best over high-speed data connections.
- Modular Messaging Restricted Outlook Client. Works best over high-speed data connections.
- Modular Messaging Lotus Notes Client. Works best over high-speed data connections.
- Modular Messaging Web Client.

For more information, see [Graphical user interfaces](#) on page 70.

Message Addressing - For simplicity, use a fixed-length uniform dial plan. Usually, this allows subscribers' mailbox numbers to be the same as their extension numbers. When mailbox numbers cannot be the same as extension numbers, subscribers need to understand the difference between an extension number and a mailbox number. The extension is used for calling an associate at the same location, whereas a called number is needed to call an associate at a remote location. The called number might include a prefix followed by the extension. Therefore, users might have to use two types of dial schemes, one for local associates and one for networked associates.

A mailbox number is used for addressing messages. The mailbox number is a fixed length that is used consistently for all users, regardless of the location of the sender or the recipient.

Outdialing - The programming of numbers for calls to be generated from the Modular Messaging system must take into context the PBX to which it is directly connected. The user or

Other planning considerations

administrator must be sure to program the number that must be dialed from the prime PBX and not just the extension number associated with the remote switch. This includes:

- Covering extension of a given mailbox
- Operator associated with Automated Attendant or a Caller Application
- Fax number for printing or addressing faxes
- Rules associated with Call Me for outcalling
- Rules associated with Find Me
- Number that the system should call when a GUI user wants to work in dual connect mode (that is, command and control from the computer; listen and record through the telephone).

Time zone - Modular Messaging supports the multiple time zones feature that enables subscribers to adjust the time zone settings for their mailboxes. This feature is beneficial to subscribers that might reside in different time zones than that of the Modular Messaging system or to mobile users of the Modular Messaging system. Time zone adjustments impact the time stamp associated with messages and schedules associated with mailbox rules.

Automated Attendant and Caller Applications schedules are not adjusted by the time zone settings, and need special attention by system administrators.

Network topology - The communication server networking topology has some impact on the choice of switch integration used with Modular Messaging. Modular Messaging currently supports centralized messaging for a homogeneous set of PBXs using a common networking protocol. Currently, it is necessary to implement separate Modular Messaging VMDs per PBX type. The QSIG standards allows a third party PBX such as a Nortel to network to an Avaya Communication Manager server that is integrated with a Modular Messaging system.

Dial plan - A DCS or DCS+ network requires that all extensions are of the same length. This would typically match directly to the voice mailbox number in Modular Messaging. A QSIG network supports mixed-number length dial plans according to E.164 numbering standards. Interswitch dialing, however, must conform to using uniform dial plan (UDP), private network access (PNA), or automatic alternate routing (AAR). A prefix can be added to convert the station number to the same length as the mailbox number in Modular Messaging.

Avaya Communication Manager supports variable length extensions on a single switch. The mailbox number, however, must be a fixed length. Hence, the dial plan and mailbox numbering scheme need to be aligned.

Interswitch provisioning - The PBX network needs to support the traffic associated with getting Call Answer calls across the network and for subscribers retrieving their messages. Traffic studies might be necessary, and once the messaging system is implemented, actual traffic can be measured for tuning the network. For planning purposes, expect the voice mail system to be used an average of 6 minutes per day per subscriber. Also for initial planning purposes, assume a 14% busy hour if all users are in the same time zone. If callers and users are across multiple time zones, the percentage of traffic during the busy hour will likely be lower.

Provisioning the network for Automated Attendant and Caller Applications also needs to be accounted for.

PBX programming and network implementation - Special attention is required to coordinate the dial plan, consisting of extensions with prefixes with the mailbox numbering scheme in the Modular Messaging system. Attention is also required when using translations from DCS+ to QSIG. Avaya highly recommends that customers acquire the services of Avaya's Network Integration Center to assist with the implementation of a centralized messaging system, to ensure that the translations and routing tables and Avaya Communication Manager features are implemented correctly.

Fail over - Consider how to deal with the backup scenario of coverage to voice mail at the central site when the PBX network is unavailable. The remote switch can be programmed so that the secondary coverage path is to a Caller Application on the Modular Messaging system at the central site through the PSTN. A gateway in local survivable processor (LSP) mode should be programmed to cover to voice mail through a Caller Application. Avaya Communication Manager 2.2 and later inserts the digits into the application to connect the caller to the correct mailbox.

Planning and implementation - When considering centralized messaging deployments, customers should engage the assistance of their Avaya account team or authorized business partner with the assistance of the Avaya Advanced Technology and Consulting (ATAC) organization. To assist with the implementation of a centralized Modular Messaging system with Avaya Communication Manager, customers are advised to procure the services of Avaya's Network Integration Center (NIC). NIC will supply engineering expertise to ensure that the routing and translations in context of the desired dial plan are properly configured to support the centralized messaging solution.

Other planning considerations

Appendix A: Grade of service

This appendix provides information about the average number of ports in use during the busy hour.

[Table 115](#) uses the Erlang B and Erlang C models to provide information about the port capacity in Erlangs, for each grade of service (GOS).

Note:

Erlangs, Centum Call Seconds (CCSs), and minutes are three different measures of traffic. Sixty minutes = 1 Erlang = 36 CCSs.

The Erlang B model: The Erlang B model represents a scenario in which incoming calls are not queued on the switch. If a caller calls when all ports are busy, the caller hears a busy tone and the call is blocked.

GOS with Erlang B = probability of being blocked and thus busy tone.

The Erlang C model: The Erlang C model represents a scenario in which incoming calls are queued on the switch. The caller hears multiple rings if all ports are in use, and the call is significantly delayed. The call is eventually answered if the caller does not hang up.

GOS with Erlang C = probability of encountering a delay and thus ring back. If there is a delay, the probability of delay is more than 10% of the average hold time (AHT).

Avaya Communication Manager with Q-Signaling (QSIG) integration does not support queuing of calls when all ports are busy.

Table 115: Average number of ports in use during the busy hour

Ports	P.01	P.02	P.03	P.04	P.05	P.01	P.02	P.03	P.04	P.05
—	Erlang B Model					Erlang C Model				
4	0.87	1.09	1.26	1.40	1.52	0.89	1.09	1.23	1.34	1.43
8	3.13	3.63	3.99	4.28	4.54	3.13	3.53	3.80	4.01	4.18
12	5.88	6.61	7.14	7.57	7.95	5.84	6.40	6.77	7.05	7.28
16	8.88	9.83	10.51	11.06	11.54	8.79	9.49	9.94	10.29	10.56
20	12.03	13.18	14.00	14.66	15.25	11.91	12.72	13.25	13.64	13.96
23	14.47	15.76	16.68	17.42	18.08	14.32	15.21	15.78	16.21	16.56
24	15.30	16.63	17.58	18.35	19.03	15.14	16.05	16.64	17.08	17.44
30	20.34	21.93	23.06	23.99	24.80	20.12	21.18	21.85	22.35	22.76
32	22.05	23.73	24.92	25.89	26.75	21.82	22.92	23.61	24.13	24.55
36	25.51	27.34	28.65	29.72	30.66	25.25	26.42	27.17	27.72	28.17

Table 115: Average number of ports in use during the busy hour (continued)

Ports	P.01	P.02	P.03	P.04	P.05	P.01	P.02	P.03	P.04	P.05
—	Erlang B Model					Erlang C Model				
40	29.01	31.00	32.41	33.58	34.60	28.72	29.97	30.76	31.34	31.82
46	34.32	36.53	38.11	39.40	40.54	33.99	35.35	36.20	36.83	37.33
48	36.11	38.39	40.02	41.36	42.54	35.77	37.16	38.02	38.67	39.19
56	43.31	45.87	47.70	49.21	50.54	42.93	44.44	45.38	46.08	46.64
60	46.95	49.65	51.57	53.16	54.57	46.54	48.11	49.09	49.81	50.38
64	50.60	53.43	55.45	57.12	58.60	50.18	51.79	52.80	53.55	54.14
69	55.19	58.18	60.31	62.09	63.65	54.75	56.43	57.48	58.25	58.86
72	57.96	61.03	63.24	65.08	66.69	57.50	59.22	60.29	61.07	61.70
80	65.36	68.69	71.08	73.06	74.82	64.88	66.69	67.81	68.64	69.30
84	69.08	72.53	75.00	77.07	78.89	68.59	70.44	71.59	72.44	73.11
88	72.81	76.38	78.94	81.08	82.97	72.30	74.20	75.38	76.24	76.93
90	74.68	78.31	80.92	83.09	85.01	74.17	76.09	77.27	78.14	78.84
92	76.56	80.23	82.89	85.10	87.06	76.03	77.97	79.17	80.05	80.75
96	80.31	84.10	86.84	89.12	91.15	79.77	81.75	82.97	83.87	84.58
100	84.07	87.97	90.79	93.15	95.24	83.52	85.54	86.78	87.70	88.42
104	87.83	91.85	94.75	97.18	99.34	87.28	89.33	90.60	91.53	92.27
108	91.60	95.74	98.72	101.22	103.44	91.04	93.13	94.42	95.37	96.12
112	95.39	99.62	102.69	105.26	107.55	94.81	96.94	98.25	99.21	99.97
115	98.22	102.54	105.68	108.29	110.63	97.65	99.80	101.12	102.09	102.86
120	102.96	107.42	110.65	113.35	115.77	102.37	104.57	105.92	106.91	107.69
128	110.57	115.23	118.62	121.46	124.00	109.96	112.22	113.61	114.62	115.43
132	114.38	119.15	122.62	125.53	128.13	113.76	116.06	117.46	118.48	119.31
136	118.19	123.06	126.61	129.59	132.25	117.58	119.89	121.32	122.36	123.18
138	120.10	125.02	128.61	131.62	134.32	119.48	121.82	123.25	124.29	125.12
140	122.01	126.98	130.60	133.66	136.38	121.38	123.73	125.18	126.23	127.06
144	125.83	130.91	134.61	137.72	140.51	125.20	127.59	129.04	130.10	130.94
150	131.58	136.80	140.62	143.82	146.71	130.94	133.36	134.84	135.92	136.78
152	133.50	138.77	142.63	145.86	148.78	132.86	135.29	136.78	137.87	138.73

Table 115: Average number of ports in use during the busy hour (continued)

Ports	P.01	P.02	P.03	P.04	P.05	P.01	P.02	P.03	P.04	P.05
—	Erlang B Model					Erlang C Model				
156	137.32	142.70	146.64	149.94	152.91	136.69	139.14	140.65	141.75	142.62
160	141.17	146.65	150.64	154.02	157.05	140.52	143.00	144.53	145.64	146.51
161	142.13	147.63	151.65	155.04	158.08	141.48	143.98	145.50	146.61	147.48
168	148.86	154.52	158.67	162.18	165.33	148.20	150.74	152.29	153.41	154.31
176	156.56	162.42	166.71	170.34	173.61	155.90	158.48	160.06	161.21	162.12
180	160.42	166.37	170.74	174.44	177.75	159.75	162.36	163.94	165.11	166.02
184	164.27	170.33	174.76	178.53	181.91	163.60	166.24	167.84	169.01	169.93
192	172.00	178.24	182.82	186.71	190.20	171.32	173.99	175.63	176.82	177.76
200	179.74	186.16	190.89	194.89	198.50	179.05	181.77	183.43	184.64	185.59
204	183.61	190.12	194.92	198.99	202.66	182.91	185.67	187.33	188.54	189.50
207	186.51	193.10	197.95	202.07	205.78	185.82	188.59	190.27	191.48	192.44
208	187.49	194.09	198.95	203.08	206.81	186.79	189.56	191.24	192.45	193.42
210	189.42	196.07	200.97	205.14	208.89	188.73	191.50	193.19	194.42	195.38
216	195.24	202.02	207.03	211.29	215.12	194.54	197.35	199.05	200.29	201.27
224	203.01	209.97	215.12	219.50	223.45	202.30	205.14	206.88	208.12	209.12
228	206.90	213.94	219.16	223.60	227.60	206.17	209.04	210.78	212.05	213.05
230	208.84	215.93	221.18	225.64	229.68	208.12	211.00	212.74	214.00	215.00
232	210.78	217.92	223.20	227.70	231.77	210.06	212.95	214.70	215.96	216.97
240	218.56	225.87	231.29	235.91	240.10	217.84	220.76	222.53	223.82	224.83

Appendix B: Customer environment

This appendix lists the minimum hardware requirements and supported software configurations for Avaya Modular Messaging.

This appendix contains the following topics:

- [Site requirements for Avaya S3500 servers](#) on page 386
- [Site requirements for Avaya S3400 servers](#) on page 390
- [Modular Messaging and the Microsoft Windows domain infrastructure](#) on page 393
- [Considerations when implementing Modular Messaging—MSS](#) on page 395
- [Considerations when implementing Modular Messaging with e-mail servers](#) on page 398
- [Best practices for Modular Messaging customer responsibilities](#) on page 400
- [Minimum hardware requirements and supported software \(MSS\)](#) on page 402
- [Minimum hardware requirements and supported software \(Exchange\)](#) on page 419
- [Minimum hardware requirements and supported software \(Domino\)](#) on page 433
- [Other hardware and software considerations](#) on page 446



Important:

Customers are responsible for obtaining and installing anti-virus software on any Microsoft Windows computer that runs Modular Messaging software, in accordance with their local policy. In addition, Microsoft Windows security patches must be installed and routinely updated to protect the operating system from known security weaknesses. For recommended Microsoft Service Packs and Security updates, see <http://www.avaya.com/support>. For more information about security, see 'System security' document on the *Avaya Modular Messaging Documentation* CD-ROM.

Avaya support policy for third-party clients

Avaya MSS

Avaya Modular Messaging is standards based, which includes IMAP4 access to messages from user client software packages (for example, Microsoft Outlook and IBM Lotus Notes). Avaya has conducted successful interoperability testing with Microsoft Outlook 2002; Microsoft Outlook 2000; Microsoft Outlook Express 5.0; and IBM Lotus Notes R5, R6 and R7. Furthermore, Avaya acknowledges that customers have reported successful integration of GroupWise with Avaya Modular Messaging and acknowledges that our customers may integrate other IMAP4 user client software packages with Avaya Modular Messaging. Avaya, however, makes no representations, warranties, or guarantees regarding specific capabilities with specific IMAP4 clients or successful integration or interoperability thereof. Avaya's product

support is limited to IMAP4 as it is implemented on Avaya Modular Messaging and does not include support for specific e-mail clients.

Site requirements for Avaya S3500 servers

This section describes the physical requirements for the hardware, including environmental, weight, space, and power considerations for Avaya S3500 servers.

Environmental requirements

[Table 116](#) lists the environmental conditions that must be maintained in the area where the Avaya S3500 servers are installed.

Table 116: Environmental requirements

Operating state	Temperature	Humidity (noncondensing)
Operating	+10 to +35°C (+50 to +95°F)	20% to 80% RH
Nonoperating (in storage or being shipped)	-20 to +50°C (-4 to +122°F)	20% to 90% RH

[Table 117](#) lists the maximum heat output for each type of server in British thermal units (BTUs).

Table 117: Heat output in BTUs

Server model	Maximum heat output
Avaya messaging application server (MAS)	1498 BTU per hour
Avaya Message Storage Server Standard Availability version (MSS—S)	1211 BTU per hour
Avaya Message Storage Server High Availability version (MSS—H)	1573 BTU per hour

Weight and space considerations

[Table 118](#) lists the weight and spatial dimensions of the MAS and MSS on Avaya S3500 servers.

Table 118: Server weight and space considerations

Server	Weight (full)	Height	Width	Depth
Avaya MAS	36 lb (16.3 kg) without port boards	3.5 in. (9 cm)	16.9 in. (43 cm)	18.9 in. (48 cm)
Avaya MSS—S	38 lb (17.2 kg)	3.5 in. (9 cm)	16.9 in. (43 cm)	18.9 in. (48 cm)
Avaya MSS—H	42 lb (19.1 kg)	3.5 in. (9 cm)	16.9 in. (43 cm)	18.9 in. (48 cm)

For safety considerations, at least two technicians must be available to mount the units.


Customer-provided cabinet requirements

If the Avaya MAS and MSS are to be installed in a rack-mount configuration, the customer-provided cabinet must meet the following requirements:

- The cabinet must contain a four-post rack to support the weight of the server.
- The cabinet must be secured to the floor before attempting to mount any units.
- A rack size of 31.5 x 35.5 inches (800 mm x 900 mm) is best, as it provides space for cables, doors, etc., but 31.5 x 31.5 inches (800 x 800 mm) will also work.
- The sliding rails provided with each server are designed for mounting in cabinets 26 to 36 inches (660 to 914 mm) in depth.
- The racks need to have post rails 25 inches (640 mm) apart to allow for the fixing brackets.
- The cabinet height must accommodate the number of units to be mounted. It might also need to hold the MAS modems, Uninterruptible power supply (UPS), and optional equipment, such as the KVM switch.

Power requirements

[Table 119](#) lists the power requirements for the Avaya S3500 servers. Use these figures for equipment room planning, not for UPS sizing. The AC power supply source must be a single-phase three conductor consisting of line, neutral, and ground connections.

 **WARNING:**
The power cord set provided with this product must be used with this product only. Do not use the cord set with any other product, and do not use a different cord set with this product. Using the wrong cord set could lead to hazardous incidents such as electric shock, fire, and faulty operation.

警告
本製品に同梱または付属している電源コードセットは、本製品専用です。本製品以外の製品ならびに他の用途で使用しないでください。また本製品に、これ以外の電源コードセットを使用しないでください。火災、感電、故障の原因となります。

Table 119: Server power requirements

Server	Number of power supply units	Volts AC	Hertz	Maximum amperes 120V/240V
Avaya MAS	1	90 to 264 Vac	47 to 63 Hz	8.0/4.0
Avaya MSS—S	1	90 to 264 Vac	47 to 63 Hz	8.0/4.0
Avaya MSS—H	2	90 to 264 Vac	47 to 63 Hz	8.0/4.0

For equipment room planning, the AC power source requires a 15 A circuit breaker for 100-127 Vac installations or a 10 A circuit breaker for 200-240 Vac installations. Consider the server connection to a branch circuit with regard to overload or overcurrent protection. Verify the system ratings to ensure that, together with other equipment connected to the same branch circuit, an overcurrent or overload condition does not exist.

Note:

All Modular Messaging systems must use a UPS. To size a UPS, use the maximum power dissipation figures in watts. For example, 400 watts divided by 120 Vac is about 3 amps per server.

S3500 servers	Maximum power dissipation in watts, assuming 65% power supply efficiency
Avaya MAS with port boards	450 watts
MSS-S	400 watts
MSS-H	500 watts



Tip:

For more information about the site requirements, see *Modular Messaging for the Avaya Message Storage Server (MSS) Configuration Release 3 Installation and Upgrades*.

Site requirements for Avaya S3400 servers

This section describes the physical requirements for the hardware, including environmental, weight, space, and power considerations for Avaya S3400 servers.

Environmental requirements

[Table 120](#) lists the environmental conditions that must be maintained in the area where the Avaya servers are installed.

Table 120: Environmental requirements

Operating state	Temperature	Humidity (noncondensing)
Operating	+50°F to +95°F +10°C to +35°C	20% to 80% relative humidity (RH)
Nonoperating (in storage or being shipped)	-4°F to +122°F -20°C to +50°C	20% to 90% RH

[Table 121](#) lists the maximum heat output for each type of server in British thermal units (BTUs).

Table 121: Heat output in BTUs

Server model	Maximum heat output
Nonintegrated video and LAN	MAS: 730 BTU/hour MSS-S: 352 BTU/hour MSS-H: 682 BTU/hour
Integrated video and LAN	MAS: 1150 BTU/hour MSS-S: 887 BTU/hour MSS-H: 1242 BTU/hour

Weight and space considerations

[Table 122](#) lists the weight, height, width, and depth of the MAS and MSS on S3400 servers.

Table 122: Avaya MAS weight and space considerations

Server	Weight (full)	Height	Width	Depth
Avaya MAS	40 lb (18.1 kg) (without port boards)	6.8 in. (17 cm)	16.9 in. (43 cm)	18.9 in. (48 cm)
Avaya MSS-S	41 lb (18.6 kg)	6.8 in. (17 cm)	16.9 in. (43 cm)	18.9 in. (48 cm)
Avaya MSS-H	52 lb (23.6 kg)	6.8 in. (17 cm)	16.9 in. (43 cm)	18.9 in. (48 cm)

For safety considerations, at least two technicians should be on site and available to mount the units.

Customer-provided cabinet requirements

If the Avaya MAS and MSS are to be installed in a rack-mount configuration, the customer-provided cabinet must meet the following requirements:

- The cabinet must contain a four-post rack to support the weight of the server.
- The cabinet must be secured to the floor before attempting to mount any units.
- The sliding rails and extender brackets provided with each server are designed for mounting in cabinets 22.5 to 32 inches in depth.
- The cabinet height must accommodate the number of units to be mounted. It might also need to hold the MAS modems, UPS, and optional equipment such as the KVM switch.

Power requirements

[Table 123](#) lists the power requirements for the Avaya S3400 servers. The AC power supply source must be a single-phase three conductor (line, neutral, and ground), with a 15 A circuit breaker for 100-127 Vac installations or a 10-A circuit breaker for 200 to 240 Vac installations.



WARNING:

The power cord set provided with this product must be used with this product only. Do not use the cord set with any other product, and do not use a different cord set with this product. Using the wrong cord set could lead to hazardous incidents such as electric shock, fire, and faulty operation.

警告

本製品に同梱または付属している電源コードセットは、本製品専用です。本製品以外の製品ならびに他の用途で使用しないでください。また本製品に、これ以外の電源コードセットを使用しないでください。火災、感電、故障の原因となります。

Table 123: Server power requirements

Server	Number of power supply units	Volts AC	Hertz	Amperes 120V/240V
Avaya MAS	1	100–240 +/- 10%	50/60 +/- 3 Hz	10/5
Avaya MSS—S	1	100–240 +/- 10%	50/60 +/- 3 Hz	10/5
Avaya MSS—H	2	100–240 +/- 10%	50/60 +/- 3 Hz	6/3 (for each vertically stacked model of power supply) or 7/3.5 (for each side-by-side model)

Consider the server connection to a branch circuit with regard to overload or overcurrent protection. Verify the system ratings to ensure that, together with other equipment connected to the same branch circuit, an overcurrent or overload condition is nonexistent.

Modular Messaging and the Microsoft Windows domain infrastructure

Different versions of Modular Messaging relate differently to the Microsoft Windows domain infrastructure at the customer site.

The relationship that a Modular Messaging system shares with the Windows domain affects subscriber and administrator authentication.

Note:

All Modular Messaging servers must be in the same Windows domain and on the same LAN segment, whether provided by the customer or Avaya.

Modular Messaging—MSS

Private Microsoft Windows domain

Avaya MSS

When installing a Modular Messaging—MSS system, technicians create a private Microsoft Windows domain that does not require any interaction with a Microsoft Windows domain that the customer network might already have.

In fact, the Modular Messaging—MSS system does not require that the customer even have an existing Windows network. MAS units are added to the Microsoft Windows domain that is created for Modular Messaging. MAS administrators use logins that are configured in this Microsoft Windows domain.

The Modular Messaging Windows domain can be configured to trust one or more customer Microsoft Windows domains, allowing MAS administrators to use their normal Windows desktop login when administering the MAS.

Subscribers using graphical user interface (GUI) clients, Subscriber Options, or Web Subscriber Options must provide their mailbox numbers and passwords for authentication. This authentication is unrelated to any Microsoft Windows log-in mechanisms. User credentials of MAS administrators are authenticated against the Microsoft Windows login in the domain created during the Modular Messaging installation.



CAUTION:

Do not use the same Data Collection Tool (DCT) data file for multiple systems in a networked environment. The name for the private Windows domain must be unique throughout the entire messaging network, or errors will occur. If the private domain name is duplicated anywhere in the network, all Modular Messaging software must be reloaded on all affected servers to correct the problem. Ensure that a unique private domain name is used on each Modular Messaging system.

Customer's existing Microsoft Windows domain

Alternatively, a Modular Messaging—MSS 3.1 system may be installed into a customer's existing Windows domain instead of a separate, private domain.

The customer must create both the *customer* and the *technical support* accounts in their Windows domain. This is required since specific applications (e.g., system administration) must be run using either the customer or technical support account and the account must be authenticated by the MAS. The accounts must be Active Directory (AD) accounts, as local administration accounts don't provide sufficient access and authentication control.

The Modular Messaging—MSS web administration will allow specification of a customer's corporate Windows domain.

Modular Messaging—Exchange and Modular Messaging—Domino

Microsoft Exchange

IBM Lotus Domino

Modular Messaging—Microsoft Exchange and Modular Messaging—IBM Lotus Domino systems join an existing customer Microsoft Windows domain. MAS units function as members of the Microsoft Windows domain set up by the customer.

Subscribers and administrators authenticate against the existing Microsoft Windows domain. Such authentication is based on the security standards established by the customer for the existing Microsoft Windows domain.

Note:

Users for Web Subscriber Options need to provide their mailbox numbers and passwords for authentication.

Considerations when implementing Modular Messaging—MSS

Avaya MSS

Modular Messaging—MSS uses a dedicated server and private network to isolate critical components from reliance on the customer's IT and e-mail infrastructure. Basic voice mail features including Call Answer and telephone retrieval of messages operate completely independently of this infrastructure. However, certain features rely on and interoperate with aspects of the customer's infrastructure.

IT and e-mail infrastructure considerations when implementing Modular Messaging—MSS are:

- Administrators must add the MSS and MAS hosts to the customer's Domain Name Servers (DNSs) for:
 - Using any desktop client
 - Sending networked messages
 - Directory updating between multiple, separate Modular Messaging systems or between Modular Messaging and Message Networking systems in the customer network.

For networking between Modular Messaging systems or Modular Messaging and Message Networking systems, administrators can also add these systems to each other's hosts files without relying on DNS.

- Modular Messaging—MSS delivers all messages sent outside its voice mail domain (VMD) with the standard SMTP/MIME e-mail protocols using the customer's IT and e-mail infrastructure. Messages sent outside the VMD include networked messages and Notify Me messages. Depending on the MSS configuration options, these messages are sent in any of the following ways:
 - Using DNS mail exchanger (MX) lookups of the recipient's host.domain
 - Using an administered e-mail gateway, which then relays the message to its recipient

A configuration in which networked messages are sent directly to the destination messaging system and Notify Me messages are sent to a gateway is not explicitly supported. However, this behavior can be achieved using DNS MX routing. To do this, the customer must provide a DNS server that responds to MX queries for all hosts with the host name of the gateway. In addition, customers must either administer networked computers through hosts files or have the DNS server return the actual IP address for networked Modular Messaging hosts.

- Messages sent outside a voice mail domain using SMTP/MIME carry an e-mail *from*: address that identifies the sender's Modular Messaging mailbox. This address is usually in the form *first.last@mmsystem.domain.company.com*. If these messages are sent through an e-mail gateway in the customer's network that modifies the outbound *from*: addresses,

replies to these messages are redirected to an incorrect address. For example, if the e-mail gateway replaces the host.domain portion with a fixed string such as *company.com*.

Many companies use *first.last@company.com* as the e-mail address for a user's Exchange or IBM Lotus Notes mailbox. These addresses have the same e-mail handle, that is, *first.last@* part, so if the host.domain portion of a message sent from a user's Modular Messaging mailbox is replaced, replies will go to the user's regular e-mail mailbox.

Customers must ensure that messages sent between Modular Messaging systems are not sent through such e-mail gateways. Alternatively, customers must ensure that the gateway is configured to retain the original, unmodified *from:* address of messages sent between Modular Messaging systems.

- The Notify Me feature allows notification messages to be sent to any e-mail address, including addresses outside the customer's network. Such messages must be sent through an outbound e-mail gateway in the customer's network. Consideration should be given to what the *from:* address indicates in this case. The *from:* address when sent by the Modular Messaging system identifies the subscriber's Modular Messaging mailbox. Many companies' outbound e-mail gateways are configured to replace the host.domain portion of *from:* addresses with a fixed string such as *company.com*. If the host.domain portion of the message is replaced, replies will go to the user's regular e-mail mailbox. However, if the Modular Messaging and e-mail addresses are coordinated, this might be precisely what is wanted. Administrators can change the gateway processing rules to modify *from:* addresses for messages sent from Modular Messaging systems into a form that cannot be replied to, such as *do_not_reply@company.com*. With this approach, users would not receive indication of problems with their notification messages. Alternatively, administrators can change the gateway to modify *from:* addresses for messages sent from Modular Messaging into an administrative mailbox, for example *postmaster@company.com*. With this approach, failures related to notification messages would be delivered to the company's e-mail postmaster.
- When deploying a Modular Messaging—MSS system, the customer must choose whether the e-mail address for subscriber mailboxes specifies the actual host.domain of the MSS or is an e-mail host alias. This e-mail address is used for networking and when sending messages using desktop clients. The default is to use the actual host.domain name of the MSS. If an e-mail host alias is used, administrators must add this name to the customer's DNS servers or remote systems' hosts files. Multiple Modular Messaging systems within a single customer's network cannot share identical e-mail host aliases.
- The customer must choose whether to allow incoming Internet e-mail to be delivered to subscribers' Modular Messaging mailboxes. Internet e-mail includes Notify Me messages that are returned because they were sent to incorrect addresses and possibly replies to such messages. If the customer chooses to allow such messages to be delivered, the customer's external e-mail infrastructure must be able to associate an incoming address to the subscriber's Modular Messaging mailbox. One way to do this is to use an e-mail host alias, such as *mm.company.com*, and register this domain with the customer's external DNS servers. Another way is to use Modular Messaging e-mail addresses with e-mail handles distinct from those used for regular e-mail addresses. For example, a user's e-mail address might be *first.last@company.com* while the Modular Messaging mailbox might be *first.last.mm@company.com*. If the customer allows Internet e-mail into Modular

Messaging mailboxes, Avaya strongly suggests that all such e-mail be filtered for spam and viruses before being delivered to the Modular Messaging system.

Considerations when implementing Modular Messaging with e-mail servers

Microsoft Exchange

IBM Lotus Domino

Modular Messaging—Exchange and Modular Messaging—Domino systems fit within the existing IT infrastructure at the customer site. These systems are more sensitive to the customer environment than a Modular Messaging—MSS system is, where a dedicated server and private network are used to isolate critical operations.

Some additional considerations when implementing Modular Messaging with e-mail servers are:

- To confirm that the Microsoft Exchange and IBM Lotus Domino e-mail systems have been deployed and are being operated according to Microsoft and IBM specifications, respectively.
- To assess the impact that the Modular Messaging solution will have on the existing e-mail environment. The messaging requirements of a unified message store increase the utilization of the e-mail server, mailboxes, and system administration. Thus, the CPU utilization and memory requirements of the e-mail servers need to be able to support the additional processing requirements for the voice mail application.

Note:

Customers must keep their systems within performance operating ranges recommended by Microsoft and IBM Lotus. To support the extra load for voice messaging, Avaya requires that the CPU utilization be no more than 50%.

- To evaluate the customer's LAN environment to ensure that it can support the application. In Modular Messaging with e-mail servers, all the communications for the application run on the customer's network. Thus, the occupancy of the customer's IP network needs to be assessed to determine if it can support the additional load and to provide the responsiveness for the real-time aspects of the solution.

Note:

The customer's estimated busy-hour LAN occupancy, including the incremental traffic due to voice messaging, must be less than 25%.

- To ensure that certain factors are in harmony and meet the specifications for the solution to perform reliably. These factors include the release level of e-mail, how it is configured, operating systems, what is being used for directory authentication, and other hardware, software, and operating system elements that will be involved in the overall architecture and its topology.

The assessment of the customer environment might determine that it meets the operational specifications for a Modular Messaging system with e-mail servers. However, customers must

Considerations when implementing Modular Messaging with e-mail servers

maintain the reliability of their environment and ensure that the e-mail environment and data network are not in a constant state of flux.

Best practices for Modular Messaging customer responsibilities

This section provides information about best practices for Modular Messaging customer responsibilities.

Customer participation

Successful planning and implementation of a Modular Messaging system require cross-functional participation from a variety of disciplines from within the customer organization. The following disciplines may be represented by single or multiple individuals or organizations:

- Telephony management
- Voice mail management
- E-mail management
- Desktop computing
- Server management
- Help desk
- IP network management
- SMTP gateway
- Data network security
- User community

System planning forms

In preparation for a Modular Messaging implementation, customers must have some very specific information available related to their system implementation and data network. The necessary items are identified in System Planning forms for Modular Messaging, as provided in Appendix A of the installation guides, or available as a downloadable file from the Avaya Support Web site at <http://www.avaya.com/support>.

Considerations for switch integration

When integrating the Modular Messaging system with the host private branch exchange (PBX), planners and customers must consider the following:

- Switch hardware and software to support required provisioning
- Features supported by a particular integration type
For more information, see [Switch integration matrix](#) on page 216.
- Programming of translations for networked PBXs or IP gateways for centralized deployments

- Any updates that the dial plan requires, especially when Modular Messaging is to be networked with a Message Networking system

For the latest switch integration information, see the configuration notes available on the Avaya Support Web site at <http://www.avaya.com/support>.

Current system review

If an existing messaging system at the customer site is to be retained along with the Modular Messaging system, a review of the existing messaging system is recommended, to assess what functionality needs to be accounted for. For example:

- Hosting Automated Attendant on the messaging servers or on the PBX.
- The impact of any change in voice mail access numbers on abbreviated dial buttons and call coverage paths.

Establishing system parameters

With the introduction of a new messaging system, existing system parameters, if any, might need to be updated. For example, certain size limits might no longer be appropriate with Modular Messaging. The definition of Class-of-Service (COS) templates helps in determining the features that are available within the different Classes-of-Service. For information about the features that are set on a COS basis, see [Options set on a Class-of-Service basis](#) on page 451.

E-mail management

When implementing a Modular Messaging system with a Microsoft Exchange or an IBM Lotus Domino message store, customers might need to make changes to the existing e-mail infrastructure. Avaya recommends an assessment of the network bandwidth and e-mail resources to ensure optimal network performance for message transport between desktop applications and the e-mail servers.

Security processes

Prior to the implementation of a Modular Messaging system, security staff at the customer organization must review and approve the Modular Messaging deployment. Customers must engage the expertise of their security staff early in the implementation process to allow them to include the messaging servers in their internal approval processes. Security staff must consider how the Modular Messaging system fits into their routine for virus protection, patches, and service packs.

For more information, see Security and Avaya Modular Messaging with the Avaya S3400 Message Server available in the Messaging White Papers Resource Library on the Avaya Web site at <http://www.avaya.com>.

Minimum hardware requirements and supported software (MSS)

This section provides information about the minimum hardware requirements and supported software for Modular Messaging—MSS.

MAS specifications with Modular Messaging—MSS

Avaya MSS

Modular Messaging—MSS uses Avaya-provided MAS units for which Avaya provides the Modular Messaging software and the hardware. For Modular Messaging Release 3, Avaya provides the S3500 hardware.

Modular Messaging continues to support Avaya S3400 servers for systems that have upgraded from earlier versions of Modular Messaging to Modular Messaging Release 3.

Specifications of an S3500 MAS

[Table 124](#) provides the hardware specifications of an Avaya-provided S3500 MAS.

Table 124: S3500 MAS hardware specifications

Clock speed	RAM
Intel Pentium IV 3.4-GHz processor	2 GB

[Table 125](#) lists the supported voice cards.

Table 125: Supported voice cards for an S3500 MAS with Modular Messaging—MSS

Protocol	Voice card	Maximum cards per MAS, any telephone user interface (TUI)	Maximum ports ¹ per MAS, any TUI
SIP ²	—	—	48
H.323 integration ²	—	—	30
T1 QSIG	Dialogic D/480JCT-1T1	2	46
E1 QSIG	Dialogic D/600JCT-1E1-120	2	60
Digital Set Emulation (DSE)	Dialogic D/82JCT-U (5v card) Dialogic D82JCTPCIUNIV (3.3v and 5v universal card)	2	16
Analog	12-port Dialogic D/120JCT	2	24
	4-port Dialogic D/41JCT-LS	2	8

1. The number of ports that an MAS can support is restricted by the number of PCI slots available and the number of cards supported.

2. SIP and H.323 transmit voice as IP packets over the LAN cards; thus separate port cards are not required.

Note:

For upgrades from Modular Messaging Release 1, the only Dialogic voice card supported is Dialogic D/82JCT/U.

Also required are:

- DVD-ROM drive to install the software
- LAN connectivity of 100 megabits per second (mbps) speed
- 80 GB of free disk space
- Dialogic drivers: 6.0 SU95
- PCI-X slots for the Dialogic telephony cards

[Table 126](#) provides the software specifications of an S3500 MAS.

Table 126: Software specifications of an S3500 MAS

Supported software	Version
Microsoft Windows	Microsoft Windows Server 2003 Server Appliance Kit (SAK) with Service Pack 1 (SP1) ¹
Internet browser	Microsoft Internet Explorer 6.0 SP1

Customer environment

1. Internet Information Services (IIS) 6.0 is required and is included with Microsoft Windows Server 2003.

Note:

Avaya-provided S3500 hardware is installed from an image, which installs Microsoft Windows 2003 Server and the latest service packs and hotfixes.



Tip:

Avaya recommends customer-provided virus protection for all Microsoft Windows servers.

Specifications of an S3400 MAS

[Table 127](#) provides the hardware specifications of an Avaya-provided S3400 MAS.

Table 127: S3400 MAS hardware specifications

Clock speed	RAM
Intel Pentium IV 2.0-GHz processor	512 MB

[Table 128](#) lists the recommended voice cards for an Avaya S3400 MAS.

Table 128: Recommended voice cards for an S3400 MAS

Protocol	Voice card	Maximum cards per MAS		Maximum ports ¹ per MAS	
—	—	Aria TUI	AUDIX or Serenade TUI	Aria TUI	AUDIX or Serenade TUI
SIP ²	—	—	—	20	20
H.323 integration ²	—	—	—	20	20
T1 QSIG	Dialogic D/480JCT-1T1	2	1	46	23
E1 QSIG	Dialogic D/600JCT-1E1-120	1	1	30	30
DSE	Dialogic D/82JCT-U (5v card) Dialogic D82JCTPCIUNIV (3.3v and 5v universal card)	4	3	32	24
Analog	12-port Dialogic D/120JCT	4	2	48	24
	4-port Dialogic D/41JCT-LS	4	4	16	16

1. The number of ports that an MAS can support is restricted by the number of PCI slots available and the number of cards supported.

2. SIP and H.323 integration transmit voice as IP packets over the LAN cards; thus separate port cards are not required.

Note:

For upgrades from Modular Messaging Release 1, the only Dialogic voice card supported is Dialogic D/82JCT/U.

Also required are:

- DVD-ROM drive to install the software
- LAN connectivity of 100 mbps speed
- 80 GB of free disk space
- Dialogic drivers: 6.0 SU95
- PCI-X slots for the Dialogic telephony cards

[Table 129](#) provides the software specifications of an S3400 MAS.

Table 129: Software specifications of an S3400 MAS

Supported software	Version
Microsoft Windows	Microsoft Windows Server 2003 SAK SP1 ¹
Internet browser	Microsoft Internet Explorer 6.0 SP1

1. IIS 6.0 is required and is included with Microsoft Windows Server 2003.

Note:

Avaya-provided S3400 hardware is installed from an image, which installs Microsoft Windows Server 2003 and the latest service packs and hotfixes.



Tip:

Avaya recommends customer-provided virus protection for all Microsoft Windows servers.

Modular Messaging Outlook Client requirements

Avaya MSS

This section provides the system requirements for Modular Messaging Outlook Client with Modular Messaging—MSS.

The hardware specifications for Modular Messaging Outlook Client with Modular Messaging—MSS are:

- Processor speed: As per standard Microsoft recommendations
- 512 MB of RAM
- 200 MB of free disk space (minimum)

[Table 130](#) lists the software specifications for Modular Messaging Outlook Client.

Table 130: Supported software for Modular Messaging Outlook Client (MSS)

Supported software	Version
Microsoft Windows	Microsoft Windows XP Professional N ¹ Microsoft Windows XP Professional SP2 Microsoft Windows 2000 Professional SP4
Microsoft Outlook	Microsoft Outlook 2003 SP1 Microsoft Outlook 2002 SP3 Microsoft Outlook 2000 SP3 ²

1. Microsoft Windows XP N includes Microsoft Windows XP SP2.
2. Modular Messaging Outlook Client supports only Microsoft Outlook 2000 installed for the Corporate Workgroup mode. Microsoft Outlook 2000 installed for the Internet mode is not supported.

Note:
Microsoft Outlook must already be installed and the mail profile must be configured before the Voice Form component is installed.

Modular Messaging Restricted Outlook Client requirements

Avaya MSS

This section provides the system requirements for Modular Messaging Restricted Outlook Client.

The hardware specifications for Modular Messaging Restricted Outlook Client are:

- Processor speed: As per standard Microsoft recommendations
- 512 MB of RAM

- 200 MB of free disk space (minimum)

[Table 131](#) lists the software specifications for Modular Messaging Restricted Outlook Client.

Table 131: Supported software for Modular Messaging Restricted Outlook Client

Supported software	Version
Microsoft Windows	Microsoft Windows XP Professional N ¹ Microsoft Windows XP Professional SP2 Microsoft Windows 2000 Professional SP4
Microsoft Outlook	Microsoft Outlook 2003 SP1 Microsoft Outlook 2002 SP3

1. Microsoft Windows XP N includes Microsoft Windows XP SP2.

Note:

Microsoft Outlook must already be installed and the mail profile must be configured before the Voice Form component is installed.

Modular Messaging Lotus Notes Client requirements

Avaya MSS

This section provides information about the system requirements for Modular Messaging Lotus Notes Client with Modular Messaging—MSS.

Microsoft recommendations for the operating system apply.

[Table 132](#) lists the software specifications for Modular Messaging Lotus Notes Client.

Table 132: Supported software for Modular Messaging Lotus Notes Client (MSS)

Supported software	Version
Microsoft Windows	Microsoft Windows XP Professional N ¹ Microsoft Windows XP Professional SP2 Microsoft Windows 2000 Professional SP4
Lotus Notes	Lotus Notes 7.0.2 Lotus Notes 6.5.5

1. Microsoft Windows XP N includes Microsoft Windows XP SP2.

Modular Messaging Web Client requirements

Avaya MSS

Avaya support policy for Modular Messaging Web Client: Avaya Modular Messaging Web Client is standards based, which includes IMAP4 access to messages stored on the Avaya MSS. Modular Messaging Web Client can also be used to access messages stored on an IMAP4 compatible e-mail system. Avaya has conducted successful interoperability testing with Microsoft Exchange. Customers may integrate other IMAP4 e-mail systems with Modular Messaging Web Client. However, Avaya makes no representations, warranties, or guarantees regarding specific capabilities with specific IMAP4 e-mail systems or successful integration or interoperability thereof. Avaya's product support is limited to IMAP4 as it is implemented on Avaya Modular Messaging and Avaya Modular Messaging Web Client and does not include support for specific e-mail systems.

Web Client user requirements

Microsoft recommendations for the operating system apply.

[Table 133](#) lists the supported software for using Modular Messaging Web Client.

Table 133: Supported software for Modular Messaging Web Client

Supported software	Version
Microsoft Windows	Microsoft Windows XP Professional N Microsoft Windows XP Professional SP2 Microsoft Windows 2000 Professional SP4
Internet browser	Internet Explorer 6.0 SP1

Web server requirements for Modular Messaging Web Client

The Web server for Modular Messaging Web Client can be installed on a customer-provided computer, provided that computer does *not* belong to the VMD.

Note:

The Web Server for Modular Messaging Web Client cannot reside on an MAS or with other MAS applications or services, such as Tracing Service.

[Table 134](#) lists the minimum recommended hardware requirements for installing the Web server on a customer-provided computer.

Table 134: Minimum hardware requirements for the Web server

Clock speed	RAM
Intel Pentium IV 2.0-GHz processor	512 MB

Also required are:

- CD-ROM drive to install the software
- Network interface card (NIC) to connect to the corporate LAN
- LAN connectivity of 100 mbps speed
- 80 GB of free disk space
- A modem for remote services

[Table 135](#) lists the supported software for installing the Web server for Modular Messaging Web Client.

Table 135: Supported software for the Web server

Supported software	Version
Microsoft Windows	Microsoft Windows Server 2003 Standard Edition SP1, with IIS 6.0 Microsoft Windows Server 2003 Web Edition SP1, with IIS 6.0
Internet browser	Internet Explorer 6.0 SP1

Note:

If remote access is required, PC Anywhere must be installed.



Tip:

Avaya recommends customer-provided virus protection for all Microsoft Windows servers.

For more information, see *Modular Messaging Web Client Release 3 Server Installation and Upgrades* available on the Modular Messaging Web Client software CD.

Subscriber Options requirements

Avaya MSS

Modular Messaging subscribers that do not use Microsoft Outlook as an e-mail client can install Subscriber Options as a standalone component.

[Table 136](#) lists the supported software for installing Subscriber Options.

Table 136: Supported software for Subscriber Options

Supported software	Version
Microsoft Windows	Microsoft Windows XP Professional N Microsoft Windows XP Professional SP2 Microsoft Windows 2000 Professional SP4

Web Subscriber Options requirements

Avaya MSS

Web Subscriber Options client requirements

Microsoft recommendations for the operating system apply.

[Table 137](#) lists the supported software for using the Web Subscriber Options application.

Table 137: Supported software for Web Subscriber Options

Supported software	Version
Microsoft Windows	Microsoft Windows XP Professional SP2 Microsoft Windows XP Professional N Microsoft Windows 2000 Server SP4 Microsoft Windows 2000 Professional SP4 Microsoft Windows Server 2003 SAK with SP1 Microsoft Windows Server 2003 Standard Edition with SP1
Internet browser	Internet Explorer 6 with SP1

Web Subscriber Options server requirements

[Table 138](#) lists the minimum recommended hardware requirements for installing the Web server for Web Subscriber Options on either of the following computers:

- Avaya S3500 or S3400 MAS
- Customer-provided computer

Table 138: Minimum hardware requirements for the Web server for Web Subscriber Options

Server	Processor	RAM
Avaya S3500 server	Intel Pentium IV 3.4-GHz processor	2 GB
Avaya S3400 MAS or customer-provided computer	Intel Pentium III 2.0-GHz processor	1 GB

Also required are:

- DVD-ROM drive to install the software
- NIC to connect to the corporate LAN
- LAN connectivity of 100 mbps speed

- 5 GB of available space on the hard disk drive. This space must be in Windows NT File System format.
- A modem for remote services

[Table 139](#) lists the supported software for installing the Web server for Web Subscriber Options.

Table 139: Supported software for the Web server for Web Subscriber Options

Supported software	Version
For an Avaya S3500 or S3400 MAS	
Microsoft Windows	Microsoft Windows Server 2003 SAK SP1 ^{1,2}
Internet browser	Internet Explorer 6.0 SP1
For a customer-provided computer	
Microsoft Windows	Microsoft Windows Server 2003 Standard Edition SP1, with IIS 6.0 ² Microsoft Windows Server 2003 Web Edition SP1, with IIS 6.0 ²
Internet browser	Internet Explorer 6.0 SP1

1. IIS 6.0 is required and is included with Microsoft Windows Server 2003.

2. If users will select a multibyte display language on the client machines, you must install the Windows East Asian language pack on the server.

The following software is also required:

- Microsoft .NET Framework 1.1
- Microsoft Web Service Enhancements (WSE) 2.0 SP3
- Microsoft ASP .NET 1.1
- Virus protection software with the latest updates (recommended)

Note:

The MAS must be configured for Web Subscriber Options to work. See *Web Subscriber Options Server Installation* for more information on configuring the MAS to work with Web Subscriber Options.

Supplementary Server requirements

Avaya MSS

For systems of large configurations, Avaya recommends that Tracing Service be installed on a separate system, known as a Supplementary Server. The separate system for hosting Tracing Service can be either of the following:

- Avaya-provided S3500 or S3400 system that customers must purchase
- Auto-configured Avaya Store Supplementary Server that customers can purchase
- Customer-provided computer

If Tracing Service is installed on the Supplementary Server, Avaya recommends that Offline Call Answer Store and Modular Messaging Administration Clients also be located on the Supplementary Server. For Modular Messaging Release 3, services such as MWI Service, Call Me Service, and Fax Sender Service, if applicable, can also reside on the Supplementary Server. However, system performance may be improved by placing only the Tracing Service on the Supplemental Server and then enabling the other services (MWI Service, Call Me Service, and Fax Sender Service) on the MAS with the smallest number of ports.

The Supplementary Server must not have any port cards or the MAS services installed on it.

If a customer purchases an auto-configured Avaya Store Supplementary Server, only the Tracing Service is enabled on the system. However, for load balancing the customer can enable other Modular Messaging services on the system, as the services are already installed but disabled on the system.

Note:

The MAS services cannot be enabled on the Avaya Store Supplementary Server system. Similarly, Modular Messaging Performance Monitor Service and Modular Messaging Process Monitor Service cannot be enabled on the Avaya Store Supplementary Server system as these services require the MAS services. For information on the MAS services, see [MAS services and functionality](#) on page 40.

If alarming function is required along with Tracing Service, enable the alarming services, Modular Messaging Event Monitor Service and Modular Messaging Alarming Service, on the system.

Use the Data Collection Tool (DCT) to install the Avaya Store Supplementary Server.

Note:

Currently, the DCT recognizes the Avaya Store Supplementary Server as Tracing Server.

[Table 140](#) provides the hardware requirements for a Supplementary Server.

Table 140: Minimum hardware requirements for a Supplementary Server

Clock speed	RAM
For an Avaya S3500 MAS	
Intel Pentium IV 3.4-GHz processor	2 GB
For an Avaya S3400 MAS or a customer-provided computer	
Intel Pentium IV 2.0-GHz processor	512 MB

Also required are:

- DVD-ROM drive to install the software
- LAN connectivity of 100 mbps speed
- 80 GB of free disk space

[Table 141](#) lists the supported software for a Supplementary Server.

Table 141: Supported software for a Supplementary Server

Supported software	Version
For an Avaya S3500 or S3400 MAS	
Microsoft Windows	Microsoft Windows Server 2003 SAK SP1
For a customer-provided computer	
Microsoft Windows	Microsoft Windows Server 2003 Standard Edition SP1

Consider the following:

- Available disk space requirements will vary, depending on the expected size of the Tracing Service databases and Offline Call Answer Store.
- The Supplementary Server must be in the same Microsoft Windows domain as all MAS units.
- The Supplementary Server must be on the private LAN that connects the MAS units and the MSS.



Tip:

Avaya recommends customer-provided virus protection for all Microsoft Windows servers.

Administration Client requirements

Avaya MSS

Administration Clients include the Voice Mail Configurator, Voice Editor, Port Monitor, Reporting Tool, Operation History Viewer, and Caller Applications Editor.

[Table 142](#) lists the software requirements for installing Modular Messaging Administration Clients. Minimum hardware requirements follow the Microsoft recommendations for the operating system.

Table 142: Supported software for Modular Messaging Administration Clients

Supported software	Version
Microsoft Windows	Microsoft Windows Server 2003 SAK SP1 Microsoft Windows Server 2003 Standard Edition SP1 Microsoft Windows XP Professional N Microsoft Windows XP Professional SP2 Microsoft Windows 2000 Professional SP4

Note:

If customers purchase a Supplementary Server for Tracing Service, Avaya recommends installing Administration Clients on that same server due to their intensive resource requirements. For more information, see [Supplementary Server requirements](#) on page 412.

Caller Applications Editor requirements

Avaya MSS

Caller Applications Editor can be installed as a separate component.

[Table 143](#) lists the software requirements for installing Caller Applications Editor. Minimum hardware requirements follow the Microsoft recommendations for the operating system.

Table 143: Supported software for Caller Applications Editor

Supported software	Version
Microsoft Windows	Microsoft Windows Server 2003 SAK SP1 Microsoft Windows Server 2003 Standard Edition SP1 Microsoft Windows XP Professional N Microsoft Windows XP Professional SP2 Microsoft Windows 2000 Professional SP4

Data Collection Tool requirements

Avaya MSS

[Table 144](#) lists the minimum recommended hardware requirements for the Data Collection Tool.

Table 144: Minimum hardware requirements for the Data Collection Tool

Clock speed	RAM
On an Avaya S3500 server	
Intel Pentium IV 3.4-GHz processor	2 GB
On an Avaya S3400 server	
Intel Pentium IV 2.0-GHz processor	512 MB

Also required are:

- DVD-ROM drive
- 80 GB of free disk space
- LAN connectivity

[Table 145](#) lists the supported software for creating the Data Collection Tool on an MAS.

Table 145: Supported software for Data Collection Tool

Supported software	Version
Microsoft Windows	Microsoft Windows Server 2003 SAK SP1 Microsoft Windows Server 2003 Standard Edition SP1 Microsoft Windows Server 2003 Enterprise Edition SP1 Microsoft Windows XP Professional N Microsoft Windows XP Professional SP2 Microsoft Windows 2000 Advanced Server SP4 Microsoft Windows 2000 Professional SP4 Microsoft Windows 2000 Server SP4



Tip:

Avaya recommends customer-provided virus protection for all Microsoft Windows servers.

Requirements for the MSS administration interface

Avaya MSS

[Table 146](#) lists the supported software for the MSS administration interface.

Table 146: Supported software for MSS administration interface

Supported software	Version
Microsoft Windows	Microsoft Windows Server 2003 SAK SP1 Microsoft Windows Server 2003 Standard Edition SP1 Microsoft Windows XP Professional SP2 Microsoft Windows 2000 Professional SP4
Internet browser	Internet Explorer 6.0 SP1 Mozilla Firefox 1.0

Mailbox Manager minimum requirements

Avaya MSS

This section provides the minimum requirements for a single-user implementation of the Mailbox Manager application.

Hardware requirements

The minimum hardware requirements for a single-user implementation of the Mailbox Manager application are:

- Pentium III processor 533 MHz Intel-based or faster
- 256 MB of RAM or more
- CD-ROM drive
- Super VGA card and monitor with 800 x 600 minimum resolution display
- Mouse
- External or removable backup of the Mailbox Manager database
- Network connectivity
- Fixed IP address on the corporate network
- 15 GB of hard disk space or more
- LAN access to the Avaya MSS
- For access to other Avaya messaging systems: one or more modems, RS-232 communication connections, or TCP/IP (telnet) connections to send changes to systems being managed.

Supported software

[Table 147](#) lists the supported software for a single-user implementation of the Mailbox Manager application.

Table 147: Supported software for single-user implementation of Mailbox Manager

Supported software	Version
Microsoft Windows	Microsoft Windows 2003 Microsoft Windows XP Microsoft Windows XP Professional Microsoft Windows 2000 Microsoft Windows 2000 Professional
Internet browser	Internet Explorer 6.0 SP1

Note:

For client/server implementations supporting multiple administrators, remote, or WAN access to the message store, request specifications from Unimax (sales@unimax.com).

Compatibility with Avaya Integrated Management

Avaya MSS

- Avaya Site Administration Release 2 or later
- Avaya Multi-Site Administration Release 2.1 or later
- Avaya Fault and Performance Manager Release 2 or later with use of either Secure Services Gateway (SSG) or Avaya Proxy Agent

Note:

Avaya Fault and Performance Manager Release 3 or later supports trap reception directly from Modular Messaging—MSS.

Avaya Fault and Performance Manager Release 3 or later does not require either SSG or Avaya Proxy Agent for trap reception from Modular Messaging—MSS.

Minimum hardware requirements and supported software (Exchange)

This section provides the minimum hardware requirements and supported software for Modular Messaging—Exchange.

Messaging application server requirements

Microsoft Exchange

With Modular Messaging—Microsoft Exchange, Release 3, the customer can purchase software and S3500 servers from Avaya or can choose to provide a computer that will serve as the MAS. In such cases, Avaya provides the Modular Messaging software that must be installed on such customer-provided MAS units.

A customer-provided computer must meet certain minimum hardware and software requirements for successful installation of the Modular Messaging software.

Modular Messaging continues to provide support to Avaya S3400 servers when customers are upgrading from earlier versions of Modular Messaging to Modular Messaging Release 3.

Minimum hardware requirements for an MAS

[Table 148](#) lists the minimum recommended hardware requirements for installing the MAS software on an Avaya server or on a customer-provided MAS.

Table 148: Minimum system requirements for the MAS

Server	Clock speed	RAM
Avaya S3500	Intel Pentium IV 3.4-GHz processor	2 GB
Avaya S3400	Intel Pentium IV 2.0-GHz processor	512 MB
Customer-provided MAS	Intel Pentium IV 2.0-GHz processor	512 MB

Also required are:

- DVD-ROM drive to install the software
- LAN connectivity of 100 mbps speed

Note:

With Modular Messaging—Exchange, an MAS must be located on the same LAN as the e-mail server.

- 80 GB of free disk space

Customer environment

- Dialogic drivers: SR 6.0 SU95
- PCI-X slots for the Dialogic telephony cards

[Table 149](#) lists the recommended voice cards for an Avaya S3500 MAS.

Table 149: Recommended voice cards for an S3500 server

Protocol	Voice card	Maximum cards per MAS	Maximum ports ¹ per MAS
SIP ²	—	—	48
H.323 ² integration	—	—	30
T1 QSIG	Dialogic D/480JCT-1T1	2	46
E1 QSIG	Dialogic D/600JCT-1E1-120	2	60
DSE	Dialogic D/82JCT-U (5v card) Dialogic D82JCTPCIUNIV (3.3v and 5v universal card)	2	16
Analog	12-port Dialogic D/120JCT	2	24
	4-port Dialogic D/41JCT-LS	2	8

1. The number of ports that an MAS can support is restricted by the number of PCI slots available and the number of cards supported.

2. SIP and H.323 transmit voice as IP packets over the LAN cards; thus separate port cards are not required.

[Table 150](#) lists the recommended voice cards for an Avaya S3400 MAS.

Table 150: Recommended voice cards for an S3400 MAS

Protocol	Voice card	Maximum cards per MAS		Maximum ports ¹ per MAS	
—	—	Aria TUI	AUDIX or Serenade TUI	Aria TUI	AUDIX or Serenade TUI
SIP ²	—	—	—	20	20
H.323 integration ²	—	—	—	20	20
T1 QSIG	Dialogic D/480JCT-1T1	2	1	46	23
E1 QSIG	Dialogic D/600JCT-1E1-120	1	1	30	30
DSE	Dialogic D/82JCT-U (5v card) Dialogic D82JCTPCIUNIV (3.3v and 5v universal card)	4	3	32	24
Analog	12-port Dialogic D/120JCT	4	2	48	24
	4-port Dialogic D/41JCT-LS	4	4	16	16

1. The number of ports that an MAS can support is restricted by the number of PCI slots available and the number of cards supported.

2. SIP and H.323 transmit voice as IP packets over the LAN cards; thus separate port cards are not required.

[Table 151](#) lists the recommended voice cards.

Table 151: Recommended voice cards for customer-provided MAS units

Protocol	Voice card	Maximum cards per MAS	Maximum ports ¹ per MAS
SIP ²	—	—	48
H.323 integration ²	—	—	30
T1 QSIG	Dialogic D/240JCT-T1 Dialogic D/480JCT-1T1	2	46
E1 QSIG	Dialogic D/300JCT-E1-120 Dialogic D/600JCT-1E1-120	2	60 (S3500 ³) 30 (S3400 ⁴)
DSE	Dialogic D/82JCT-U (5v card) Dialogic D82JCTPCIUNIV (3.3v and 5v universal card)	4	32

Table 151: Recommended voice cards for customer-provided MAS units

Protocol	Voice card	Maximum cards per MAS	Maximum ports ¹ per MAS
Analog	12-port Dialogic D/120JCT	4	48
	4-port Dialogic D/41JCT-LS	4	16

1. The number of ports that an MAS can support is restricted by the number of PCI slots available and the number of cards supported.
2. SIP and H.323 transmit voice as IP packets over the LAN cards; thus separate port cards are not required.
3. For customer-provided MAS units that are equivalent to the Avaya S3500.
4. For customer-provided MAS units that are equivalent to the Avaya S3400.



Important:

Install Dialogic drivers from the Modular Messaging application software media that Avaya provides.

Note:

Modular Messaging supports only Dialogic analog cards for new installations.

Software requirements

[Table 152](#) lists the software requirements for an S3500 or S3400 MAS.

Table 152: Software requirements for an S3500 or S3400 MAS

Supported software	Version
Microsoft Windows	Microsoft Windows Server 2003 SAK SP1
System Management tools	Microsoft Exchange 2003 SP2 System Management Tools. This software is provided by the customer.

Note:

Avaya recommends customer-provided virus protection for all Microsoft Windows servers.

[Table 153](#) lists the software requirements for installing the MAS software on a customer-provided computer.

Table 153: Software requirements for customer-provided MAS

Supported software	Version
Microsoft Windows	Microsoft Windows Server 2003 Standard Edition SP1 Microsoft Windows Server 2003 Enterprise Edition SP1
System Management tools	Microsoft Exchange 2003 SP2 System Management tools. This software is provided by the customer.

Also required are ASP.NET services with the following properties:

Windows Components

Application Server

- Application Server console
- ASP.NET
- Enable COM+ access
- IIS
 - Common Files
 - IIS Manager
 - NNTP
 - SMTP
 - WWW
 - WW Web Services

Management and Monitoring tools

- Simple Network Management Protocol

Note:

Avaya recommends customer-provided virus protection for all Microsoft Windows servers.

Modular Messaging Outlook Client requirements

Microsoft Exchange

This section provides the software requirements for installing Modular Messaging Outlook Client with Modular Messaging—Exchange.

The hardware specifications for Modular Messaging Outlook Client with Modular Messaging—Exchange are:

- Processor speed: As per standard Microsoft recommendations
- 512 MB of RAM
- 200 MB of free disk space (minimum)

[Table 154](#) lists the supported software for installing Modular Messaging Outlook Client with Modular Messaging—Exchange.

Table 154: Supported software for Modular Messaging Outlook Client with Modular Messaging—Exchange

Supported software	Version
Microsoft Windows	Microsoft Windows XP Professional N ¹ Microsoft Windows XP Professional SP2 Microsoft Windows 2000 Professional SP4
Microsoft Outlook e-mail client	Microsoft Outlook 2000 SP3 Microsoft Outlook 2002 SP3 Microsoft Outlook 2003 SP1

1. Microsoft Windows XP N includes Microsoft Windows XP SP2

Consider the following:

- With Microsoft Windows XP, clients must log in to a Microsoft Windows domain to which the Modular Messaging system belongs.
- When running Modular Messaging Outlook Client with Microsoft Outlook 2002, the client must be Microsoft Office 2002 SP2. Alternatively, Microsoft Outlook Hotfix Q317106 must be installed on the client computer.

Subscriber Options requirements

Microsoft Exchange

Modular Messaging subscribers that do not use Microsoft Outlook as an e-mail client can install Subscriber Options as a standalone component.

[Table 155](#) lists the supported software for installing Subscriber Options.

Table 155: Supported software for Subscriber Options

Supported software	Version
Microsoft Windows	Microsoft Windows XP Professional N Microsoft Windows XP Professional SP2 Microsoft Windows 2000 Professional SP4

For Modular Messaging—Exchange, minimum hardware requirements follow the Microsoft recommendations for the operating system.

Web Subscriber Options requirements

Microsoft Exchange

Web Subscriber Options client requirements

Microsoft recommendations for the operating system apply.

[Table 156](#) lists the supported software for using the Web Subscriber Options application.

Table 156: Supported software for Web Subscriber Options

Supported software	Version
Microsoft Windows	Microsoft Windows XP Professional SP2 Microsoft Windows XP Professional N Microsoft Windows 2000 Server SP4 Microsoft Windows 2000 Professional SP4 Microsoft Windows Server 2003 SAK with SP1 Microsoft Windows Server 2003 Standard Edition with SP1
Internet browser	Internet Explorer 6.0 SP1

[Table 157](#) lists the minimum recommended hardware requirements for installing the Web server for Web Subscriber Options on either of the following computers:

- Avaya S3500 or S3400 MAS

Customer environment

- Customer-provided computer

Table 157: Minimum hardware requirements for the Web server for Web Subscriber Options

Server	Processor	RAM
Avaya S3500 server	Intel Pentium IV 3.4-GHz processor	2 GB
Avaya S3400 MAS or customer-provided computer	Intel Pentium III 2.0-GHz processor	1 GB

Also required are:

- DVD-ROM drive to install the software
- NIC to connect to the corporate LAN
- LAN connectivity of 100 mbps speed
- 5 GB of available space on the hard disk drive. This space must be in Windows NT File System format.
- A modem for remote services

[Table 158](#) lists the supported software for installing the Web server for Web Subscriber Options.

Table 158: Supported software for the Web server for Web Subscriber Options

Supported software	Version
For an Avaya S3500 or S3400 MAS	
Microsoft Windows	Microsoft Windows Server 2003 SAK SP1 ^{1,2}
Internet browser	Internet Explorer 6.0 SP1
For a customer-provided computer	
Microsoft Windows	Microsoft Windows Server 2003 Standard Edition SP1, with IIS 6.0 ² Microsoft Windows Server 2003 Web Edition SP1, with IIS 6.0 ²
Internet browser	Internet Explorer 6.0 SP1

1. IIS 6.0 is required and is included with Microsoft Windows Server 2003.

2. If users will select a multibyte display language on the client machines, you must install the Windows East Asian language pack on the server.

The following software is also required:

- Microsoft .NET Framework 1.1
- Microsoft Web Service Enhancements (WSE) 2.0 SP3
- Microsoft ASP .NET 1.1

- Virus protection software with the latest updates (recommended)

Note:

The MAS must be configured for Web Subscriber Options to work. See *Web Subscriber Options Server Installation* for more information on configuring the MAS to work with Web Subscriber Options.

Supplementary Server requirements

Microsoft Exchange

For systems of large configurations, Avaya recommends that Tracing Service be installed on a separate system, known as the Supplementary Server. The separate system for hosting Tracing Service can be either of the following:

- Avaya-provided S3500 or S3400 system that customers must purchase
- Auto-configured Exchange Supplementary Server that customers must purchase
- Customer-provided computer

If Tracing Service is installed on the Supplementary Server, Avaya recommends that Offline Call Answer Store and Modular Messaging Administration Clients also be located on the Supplementary Server. For Modular Messaging Release 3, Avaya recommends that services such as MWI Service and Call Me Service also reside on the Supplementary Server.

The Supplementary Server must not provide telephony or must not have any port cards or the MAS service installed on it.

If customers purchase an auto-configured Exchange Supplementary Server, only the Tracing Service is enabled on the system. However, for load balancing the customer can enable other Modular Messaging services on the system, as the services are already installed but disabled on the system.

Note:

The MAS services cannot be enabled on the Exchange Supplementary Server system. Similarly, Modular Messaging Performance Monitor Service and Modular Messaging Process Monitor Service cannot be enabled on the Exchange Supplementary Server system as these services require the MAS services. For information on the MAS services, see [MAS services and functionality](#) on page 40.

If alarming function is required along with Tracing Service, enable the alarming services, Modular Messaging Event Monitor Service and Modular Messaging Alarming Service, on the system.

Use the Data Collection Tool (DCT) to install the Exchange Supplementary Server.

[Table 159](#) provides the hardware requirements for a Supplementary Server.

Table 159: Minimum hardware requirements for a Supplementary Server

Server	Processor	RAM
Avaya S3500	Intel Pentium IV 3.4-GHz processor	2 GB
Customer-provided MAS	Intel Pentium IV 2.0-GHz processor	512 MB

Also required are:

- DVD-ROM drive to install the software
- LAN connectivity of 100 mbps speed
- 80 GB of free disk space

[Table 160](#) lists the supported software for a Supplementary Server.

Table 160: Supported software for a Supplementary Server

Supported software	Version
For an Avaya S3500 or S3400 MAS	
Microsoft Windows	Microsoft Windows Server 2003 SAK SP1
For a customer-provided computer	
Microsoft Windows	Microsoft Windows Server 2003 Standard Edition SP1 Microsoft Windows Server 2003 Enterprise Edition SP1

Note:

The Supplementary Server must also have Microsoft Exchange 2003 SP2 System Management Tools installed on it. This software is provided by the customer.

Consider the following:

- Available disk space requirements will vary, depending on the expected size of the Tracing Service databases and the Offline Access Remote Store.
- The Supplementary Server must be in the same Windows domain as all MAS units.
- The Supplementary Server must be on the same LAN segment as all MAS units.



Tip:

Avaya recommends customer-provided virus protection for all Microsoft Windows servers.

Administration Client requirements

Microsoft Exchange

Administration Clients include administration tools and diagnostic tools, such as:

- Operation History Viewer
- Port Monitor
- Reporting Tool
- Visual Voice Editor
- Voice Mail Configuration System
- Caller Applications Editor

Hardware requirements follow the Microsoft recommendations for the operating system.

[Table 161](#) lists the supported software for installing Modular Messaging Administration Clients.

Table 161: Supported software for Modular Messaging Administration Clients

Supported software	Version
Microsoft Windows	Microsoft Windows Server 2003 SAK SP1 Microsoft Windows Server 2003 Standard Edition SP1 Microsoft Windows Server 2003 Enterprise Edition SP1 Microsoft Windows XP Professional N Microsoft Windows XP Professional SP2 Microsoft Windows 2000 Professional SP4

Caller Applications Editor requirements

Microsoft Exchange

Caller Applications Editor can be installed as a separate component. Hardware requirements follow the Microsoft recommendations for the operating system.

[Table 162](#) lists the supported software for installing Caller Applications Editor.

Table 162: Supported software for Caller Applications Editor

Supported software	Version
Microsoft Windows	Microsoft Windows Server 2003 SAK SP1 Microsoft Windows Server 2003 Standard Edition SP1 Microsoft Windows Server 2003 Enterprise Edition SP1 Microsoft Windows XP Professional SP2 Microsoft Windows 2000 Professional SP4

Data Collection Tool requirements

Microsoft Exchange

[Table 163](#) lists the minimum recommended hardware requirements for the Data Collection Tool.

Table 163: Minimum hardware requirements for the Data Collection Tool

Server	Processor	RAM
Avaya S3500 server	Intel Pentium IV 3.4-GHz processor	2 GB
Customer-provided computer	Intel Pentium IV 2.0-GHz processor	512 MB
Avaya S3400 server	Intel Pentium IV 2.0-GHz processor	512 MB

Also required are:

- DVD-ROM drive
- 80 GB of free disk space
- LAN connectivity

[Table 164](#) lists the supported software for creating the Data Collection Tool on an MAS.

Table 164: Supported software for Data Collection Tool

Supported software	Version
Microsoft Windows	Microsoft Windows Server 2003 SAK SP1 Microsoft Windows Server 2003 Standard Edition SP1 Microsoft Windows Server 2003 Enterprise Edition SP1 Microsoft Windows XP Professional N Microsoft Windows XP Professional SP2 Microsoft Windows 2000 Advanced Server SP4 Microsoft Windows 2000 Professional SP4 Microsoft Windows 2000 Server SP4



Tip:

Avaya recommends customer-provided virus protection for all Microsoft Windows servers.

Subscriber Administration Extension requirements

Microsoft Exchange

For hardware requirements for Microsoft Exchange Subscriber Administration Extension to Exchange System Management Tools, use Microsoft recommendations for the Microsoft Exchange Administrator program.

Also required is 50 MB of free disk space for Microsoft Exchange 2007, Microsoft Exchange 2003, or Microsoft Exchange 2000.

[Table 165](#) lists the supported software for installing Microsoft Exchange Subscriber Administration Extension to Exchange System Management Tools.

Table 165: Supported software for Subscriber Administration Extension

Supported software	Version
For Microsoft Exchange 2003 or 2007	
Microsoft Windows	Microsoft Windows Server 2003 SAK SP1 Microsoft Windows Server 2003 Standard Edition SP1 Microsoft Windows Server 2003 Enterprise Edition SP1
Microsoft Exchange System Management tools	Exchange 2003 SP2 System Management tools
For Microsoft Exchange 2000	
Microsoft Windows	Microsoft Windows 2000 Server SP4 Microsoft Windows 2000 Advanced Server SP4 Microsoft Windows Server 2003 SAK SP1 Microsoft Windows Server 2003 Standard Edition SP1 Microsoft Windows Server 2003 Enterprise Edition SP1
Microsoft Exchange System Management tools	Exchange 2003 SP2 System Management tools

Note:

Modular Messaging extensions to Microsoft Exchange Administrator work only when Microsoft Exchange Administrator is installed on Intel-based computers.

Peer Exchange Server requirements

Microsoft Exchange

For hardware requirements, use Microsoft recommendations for Microsoft Exchange Server.

[Table 166](#) lists the supported software for a peer Microsoft Exchange server.

Table 166: Supported software for peer Microsoft Exchange server

Supported software	Version
Modular Messaging for Microsoft Exchange 2003 or 2007	
Microsoft Windows	Microsoft Windows Server 2003 Standard Edition SP1 Microsoft Windows Server 2003 Enterprise Edition SP1
Microsoft Exchange Server	Microsoft Exchange 2003 Server SP2
Modular Messaging for Microsoft Exchange 2000	
Microsoft Windows	Microsoft Windows Server 2003 Standard Edition SP1 Microsoft Windows Server 2003 Enterprise Edition SP1 Microsoft Windows 2000 Advanced Server SP4 Microsoft Windows 2000 Server SP4
Microsoft Exchange Server	Microsoft Exchange 2000 Server SP3 roll-up Microsoft Exchange 2000 Enterprise Server SP3 roll-up

Note:

Customers must keep their systems within performance operating ranges recommended by Microsoft. In order to support the extra load for voice messaging, Avaya requires that the CPU utilization is no more than 50%.

Minimum hardware requirements and supported software (Domino)

This section provides information about the minimum hardware requirements and supported software for Modular Messaging—Domino.

Messaging application server requirements

IBM Lotus Domino

With Modular Messaging—Domino, Release 3.1, the customer can purchase software and S3500 servers from Avaya or can choose to provide a computer that will serve as the MAS. In such cases, Avaya provides the Modular Messaging software that must be installed on these customer-provided MAS units.

A customer-provided computer must meet certain minimum hardware and software requirements for successful installation of the Modular Messaging software.

Modular Messaging—Domino Release 3.1 will not support Avaya S3400 servers when customers are upgrading from Modular Messaging Release—Domino 1.1.

Minimum hardware requirements

[Table 167](#) lists the minimum recommended hardware requirements for installing the MAS software.

Table 167: Minimum system requirements for the MAS

Server	Clock speed	RAM
Avaya S3500 MAS	Intel Pentium IV 3.4-GHz processor	2 GB
Customer-provided MAS	Intel Pentium IV 2.0-GHz processor	512 MB

Also required are:

- DVD-ROM drive to install the software
- LAN connectivity of 100 mbps speed

Note:

With Modular Messaging—Domino, an MAS must be located on the same LAN as the e-mail server.

- 80 GB of free disk space
- Dialogic drivers: 6.0 SU95

Customer environment

- PCI-X slots for the Dialogic telephony cards

[Table 168](#) lists the recommended voice cards for an Avaya S3500 MAS.

Table 168: Recommended voice cards for an S3500 server

Protocol	Voice card	Maximum cards per MAS	Maximum ports ¹ per MAS
SIP ² integration	—	—	48
H.323 ² integration	—	—	30
T1 QSIG	Dialogic D/480JCT-1T1	2	46
E1 QSIG	Dialogic D/600JCT-1E1-120	2	60
DSE	Dialogic D/82JC/-U (5v card) Dialogic D82JCTPCIUNIV (3.3v and 5v universal card)	2	16
Analog	12-port Dialogic D/120JCT	2	24
	4-port Dialogic D/41JCT-LS	2	8

1. The number of ports that an MAS can support is restricted by the number of PCI slots available and the number of cards supported.
2. SIP and H.323 transmit voice as IP packets over the LAN cards; thus separate port cards are not required.

[Table 169](#) lists the recommended voice cards.

Table 169: Recommended voice cards for customer-provided MAS units

Protocol	Voice card	Maximum cards per MAS	Maximum ports ¹ per MAS
SIP ² integration	—	—	48
H.323 ² integration	—	—	30
T1 QSIG	Dialogic D/240JCT-T1 ³ Dialogic D/480JCT-1T1	2	46
E1 QSIG	Dialogic D/300JCT-E1-120 ³ Dialogic D/600JCT-1E1-120	2	30 or 60 ⁴
DSE	Dialogic D/82JCT/U (5v card) ³ Dialogic D82JCTPCIUNIV (3.3v and 5v universal card)	4	32
Analog	12-port Dialogic D/120JCT	4	48
	4-port Dialogic D/41JCT-LS	4	16
Brooktrout Analog ⁵ (Drivers V2.38)	8-port PCI card (US and Canada) 8-port PCI international card (EMEA) 8-port PCI APAC card (APAC)	4	32

1. The number of ports that an MAS can support is restricted by the number of PCI slots available and the number of cards supported.

2. SIP and H.323 transmit voice as IP packets over the LAN cards; thus separate port cards are not required.

3. Supported only for upgrades and not for new installations.

4. 60 E1 ports are supported if the customer-provided hardware is equivalent to Avaya S3500.

5. Brooktrout analog cards are supported only for systems being upgraded. All new installations will support only Dialogic cards.



Important:

Install Dialogic drivers from the Modular Messaging application software media that Avaya provides.

Software requirements

[Table 170](#) lists the software requirements for an S3500 MAS.

Table 170: Software requirements for an S3500 MAS

Supported software	Version
Microsoft Windows	Microsoft Windows Server 2003 SAK SP1 with Lotus Notes Client 6.5.5 or 7.0.2
Internet browser	Microsoft Internet Explorer 6.0 SP1

Note:

Avaya recommends customer-provided virus protection for all Microsoft Windows servers.

[Table 171](#) lists the software requirements for installing the MAS software on a customer-provided computer. This applies to IBM Lotus Domino 7.0 and IBM Lotus Domino 6.5 environments.

Table 171: Software requirements for customer-provided MAS

Supported software	Version
Microsoft Windows	Microsoft Windows Server 2003 Standard Edition SP1 with Lotus Notes Client 6.5.5 or 7.0.2 Microsoft Windows Server 2003 Enterprise Edition SP1 with Lotus Notes Client 6.5.5 or 7.0.2
Internet browser	Microsoft Internet Explorer 6.0 SP1

Note:

Avaya recommends customer-provided virus protection for all Microsoft Windows servers.

Modular Messaging DUC 1.2.3 Client requirements

IBM Lotus Domino

This section provides the software requirements for installing Modular Messaging DUC 1.2.3 Client with Modular Messaging—Domino.

The hardware specifications for Modular Messaging DUC 1.2.3 Client with Modular Messaging—Domino are:

- Processor speed: As per standard IBM Lotus recommendations
- 512 MB of RAM
- 200 MB of free disk space (minimum)

[Table 172](#) lists the supported software for installing Modular Messaging DUC 1.2.3 Client with Modular Messaging—Domino.

Table 172: Supported software for Modular Messaging DUC 1.2.3 Client with Modular Messaging—Domino

Supported software	Version
Microsoft Windows	Microsoft Windows XP Professional N Microsoft Windows XP Professional SP2 Microsoft Windows 2000 Professional SP4
Microsoft DUC 1.2.3 e-mail client	iNotes Lotus Notes 6.5.5 Lotus Notes 7.0.2

Note:

Customers using iNotes to view messages may use Web Subscriber Options to Subscriber Options to configure Modular Messaging mailboxes, however, they will not be able to use Subscriber Options to configure mailboxes.

Consider the following:

- With Microsoft Windows XP, clients must log in to a Microsoft Windows domain to which the Modular Messaging system belongs.

Subscriber Options requirements

IBM Lotus Domino

With Modular Messaging—Domino, the installation of Domino Unified Communications (DUC) automatically installs Subscriber Options Release 1.1. After installation of DUC and Subscriber

Options Release 1.1 are complete, update Subscriber Options by installing the most recent release.

Minimum hardware requirements follow the IBM Lotus Domino recommendations for the operating system.

[Table 173](#) lists the supported software for installing IBM Lotus Domino Subscriber Options

Table 173: Supported software for IBM Lotus Domino Subscriber Options

Supported software	Version
Microsoft Windows	Microsoft Windows 2000 Professional SP4 Microsoft Windows XP Professional SP2 Microsoft Windows XP Professional N

Note:

DUC 1.2.3 must be installed for Modular Messaging—Domino. DUC is supplied by IBM and is implemented according to IBM specifications. For information about DUC, see *Administrator's Guide, Domino Unified Communications for Avaya*, which is available from IBM Lotus.

For subscribers who do not use Lotus Notes

Modular Messaging subscribers who do not use Lotus Notes as an e-mail client can install Subscriber Options as a standalone component.

[Table 174](#) lists the supported software for installing Subscriber Options.

Table 174: Supported software for Subscriber Options

Supported software	Version
Microsoft Windows	Microsoft Windows 2000 Professional SP4 Microsoft Windows XP Professional SP2 Microsoft Windows XP Professional N

Web Subscriber Options requirements

IBM Lotus Domino

Web Subscriber Options client requirements

Microsoft recommendations for the operating system apply.

[Table 175](#) lists the supported software for using the Web Subscriber Options application.

Table 175: Supported software for Web Subscriber Options

Supported software	Version
Microsoft Windows	Microsoft Windows XP Professional SP2 Microsoft Windows XP Professional N Microsoft Windows 2000 Server SP4 Microsoft Windows 2000 Professional SP4 Microsoft Windows Server 2003 SAK with SP1 Microsoft Windows Server 2003 Standard Edition with SP1
Internet browser	Internet Explorer 6.0 SP1

Web Subscriber Options server requirements

[Table 176](#) lists the minimum recommended hardware requirements for installing the Web server for Web Subscriber Options on either of the following computers:

- Avaya S3500 MAS
- Customer-provided computer

Table 176: Minimum hardware requirements for the Web server for Web Subscriber Options

Server	Processor	RAM
Avaya S3500 server	Intel Pentium IV 3.4-GHz processor	2 GB
Customer-provided computer	Intel Pentium III 2.0-GHz processor	1 GB

Also required are:

- DVD-ROM drive to install the software
- NIC to connect to the corporate LAN
- LAN connectivity of 100 mbps speed
- 5 GB of available space on the hard disk drive. This space must be in Windows NT File System format.
- A modem for remote services

[Table 177](#) lists the supported software for installing the Web server for Web Subscriber Options.

Table 177: Supported software for the Web server for Web Subscriber Options

Supported software	Version
For an Avaya S3500 MAS	
Microsoft Windows	Microsoft Windows Server 2003 SAK SP1 ^{1,2}
Internet browser	Internet Explorer 6.0 SP1
For a customer-provided computer	
Microsoft Windows	Microsoft Windows Server 2003 Standard Edition SP1, with IIS 6.0 ² Microsoft Windows Server 2003 Web Edition SP1, with IIS 6.0 ²
Internet browser	Internet Explorer 6.0 SP1

1. IIS 6.0 is required and is included with Microsoft Windows Server 2003.

2. If users will select a multibyte display language on the client machines, you must install the Windows East Asian language pack on the server.

The following software is also required:

- Microsoft .NET Framework 1.1
- Microsoft Web Service Enhancements (WSE) 2.0 SP3
- Microsoft ASP .NET 1.1
- Virus protection software with the latest updates (recommended)

Note:

The MAS must be configured for Web Subscriber Options to work. See *Web Subscriber Options Server Installation* for more information on configuring the MAS to work with Web Subscriber Options.

Supplementary Server requirements

IBM Lotus Domino

For systems of large configurations, Avaya recommends that Tracing Service be installed on a separate system, known as a Supplementary Server. The separate system for hosting Tracing Service can be either of the following:

- Avaya-provided S3500 system that customers must purchase
- Customer-provided computer.

If Tracing Service is installed on a Supplementary Server, Avaya recommends that Offline Call Answer Store and Modular Messaging Administration Clients also be located on the Supplementary Server. For Modular Messaging 3.0 and later, Avaya recommends that services such as MWI Service and Call Me Service also reside on the Supplementary Server.

The Supplementary Server must not provide telephony service. Additionally, it must not have any port cards or the MAS service installed on it.

Note:

The MAS services cannot be enabled on the Supplementary Server system. Similarly, Modular Messaging Performance Monitor Service and Modular Messaging Process Monitor Service cannot be enabled on the Supplementary Server system as these services require the MAS services. For information on the MAS services, see [MAS services and functionality](#) on page 40.

If alarming function is required along with Tracing Service, enable the alarming services, Modular Messaging Event Monitor Service and Modular Messaging Alarming Service, on the system.

Use the Data Collection Tool (DCT) to install the Supplementary Server.

[Table 178](#) lists the minimum recommended hardware requirements for the Supplementary Server.

Table 178: Minimum hardware requirements for the Supplementary Server

Server	Processor	RAM
Avaya S3500 server	Intel Pentium IV 3.4-GHz processor	2 GB
Customer-provided computer	Intel Pentium IV 2.0-GHz processor	512 MB

Also required are:

- DVD-ROM drive to install the software
- 80 GB of free disk space
- LAN connectivity of 100 Mbps speed

[Table 179](#) lists the supported software for the Supplementary Server

Table 179: Supported software for Supplementary Server

Supported software	Version
For an Avaya S3500 MAS	
Microsoft Windows	Microsoft Windows Server 2003 SAK SP1

Table 179: Supported software for Supplementary Server

For a customer-provided computer	
Microsoft Windows	Microsoft Windows Server 2003 Standard Edition SP1 Microsoft Windows Server 2003 Enterprise Edition SP1

Consider the following:

- Available disk space requirements will vary depending on the expected size of the Tracing Service databases and Offline Access Remote Store.
- The Supplementary Server must be running on the same operating system as the MAS units in the VMD.
- The Supplementary Server must be in the same Windows domain as all MAS units.
- The Supplementary Server must be on the same LAN segment as all MAS units.



Tip:

Avaya recommends customer-provided virus protection for all Microsoft Windows servers.

Administration Client requirements

IBM Lotus Domino

Administration Clients include administration tools and diagnostic tools.

[Table 180](#) lists the minimum recommended hardware requirements for installing the following Modular Messaging Administration Clients:

- Voice Mail Configurator
- Voice Editor
- Port Monitor
- Reporting Tool
- Operation History Viewer

Table 180: Minimum hardware requirements for Modular Messaging Administration Clients

Clock Speed	RAM
Intel Pentium 200-MHz single- or dual-processor	128 MB

Also required are:

- DVD-ROM drive to install the software.

- 1 GB of free disk space
- LAN connectivity
- RAM as Microsoft recommends for the operating system

[Table 181](#) lists the supported software for installing Modular Messaging Administration Clients.

Table 181: Supported software for Modular Messaging Administration Clients

Supported software	Version
Microsoft Windows	Microsoft Windows 2000 Professional SP4 Microsoft Windows XP Professional SP2 Microsoft Windows XP Professional N Microsoft Windows 2003 SAK SP1 Microsoft Windows 2003 Standard Edition SP1 Microsoft Windows 2003 Enterprise Edition SP1
Internet browser	Microsoft Internet Explorer 6.0 SP1

Caller Applications Editor requirements

IBM Lotus Domino

Hardware requirements follow the Microsoft recommendations for the operating system.

[Table 182](#) lists the supported software for installing Caller Applications Editor.

Table 182: Supported software for Modular Messaging Caller Applications Editor

Supported software	Version
Microsoft Windows	Microsoft Windows 2000 Professional SP4 Microsoft Windows XP Professional SP2 Microsoft Windows XP Professional N Microsoft Windows 2003 SAK SP1 Microsoft Windows 2003 Standard Edition SP1 Microsoft Windows 2003 Enterprise Edition SP1

Peer Domino Server requirements

IBM Lotus Domino

For minimum hardware requirements, use IBM Lotus recommendations for Domino Server.

[Table 183](#) lists the supported software for a peer IBM Lotus Domino server.

Table 183: Supported software for peer IBM Lotus Domino server

Supported software	Version
Modular Messaging for Domino 6.5	
Microsoft Windows	Microsoft Windows 2000 Server SP4 Microsoft Windows 2000 Advanced Server SP4 Microsoft Windows Server 2003 Standard Edition SP1 Microsoft Windows Server 2003 Enterprise Edition SP1
IBM Lotus Domino Server	IBM Lotus Domino Server 6.5
Modular Messaging for Domino 7.0.x	
Microsoft Windows	Microsoft Windows 2000 Server SP4 Microsoft Windows 2000 Advanced Server SP4 Microsoft Windows Server 2003 Standard Edition SP1 Microsoft Windows Server 2003 Enterprise Edition SP1
IBM Lotus Domino Server	IBM Lotus Domino Server 7.0.x

Note:

DUC 1.2.3 must be installed for Modular Messaging—Domino. DUC is supplied by IBM and is implemented according to IBM specifications. For information about DUC, see *Administrator's Guide, Domino Unified Communications for Avaya*, which is available from IBM Lotus.

Note:

Customers must keep their systems within performance operating ranges recommended by IBM Lotus. To support the extra load for voice messaging, Avaya requires that the CPU utilization be no more than 50%.

Data Collection Tool requirements

IBM Lotus Domino

[Table 184](#) lists the minimum recommended hardware requirements for the Data Collection Tool.

Table 184: Minimum hardware requirements for the Data Collection Tool

Server	Processor	RAM
Avaya S3500 server	Intel Pentium IV 3.4-GHz processor	2 GB
Customer-provided computer	Intel Pentium IV 2.0-GHz processor	512 MB

Also required are:

- DVD-ROM drive
- 80 GB of free disk space
- LAN connectivity

[Table 185](#) lists the supported software for creating the Data Collection Tool on an MAS.

Table 185: Supported software for Data Collection Tool

Supported software	Version
Microsoft Windows	Microsoft Windows Server 2003 SAK SP1 Microsoft Windows Server 2003 Standard Edition SP1 Microsoft Windows Server 2003 Enterprise Edition SP1 Microsoft Windows XP Professional N Microsoft Windows XP Professional SP2 Microsoft Windows 2000 Advanced Server SP4 Microsoft Windows 2000 Professional SP4 Microsoft Windows 2000 Server SP4



Tip:

Avaya recommends customer-provided virus protection for all Microsoft Windows servers.

Other hardware and software considerations

Other hardware and software considerations include:

- Virus protection software
- Domino Unified Communications (DUC) software from IBM, for Modular Messaging—Domino

Avaya provides DUC with Modular Messaging—Domino. DUC needs to be installed according to IBM documentation.

- Extended Battery Modules and Bypass Distribution Module for backup power management

Avaya requires that customers use a UPS regardless of the Modular Messaging version. Customers can purchase the UPS from Avaya, or they can purchase it elsewhere. For more information, see [Table 119](#).

- Server administration: monitors, keyboards, KVM switch, modem, rack
- Customer-provided fax server, for Modular Messaging—Exchange and Modular Messaging—Domino

For information about the hardware and software support and telephony boards for third-party fax servers, see [Providing interoperability with third-party fax servers](#) on page 197.

- Client and server hardware and software required for the multi-administrator implementation of the Mailbox Manager application
- Unified Communication Center (UCC) Speech Access hardware and software requirements

For more information, see <http://www.avaya.com/support>.

- Networking by means of a Message Networking server
- Remote access to all servers

Avaya requires remote access to all servers to provide support for the Modular Messaging system. Avaya S3400 servers include a Universal Serial Bus (USB) modem for this purpose. For configurations with the MSS, the Remote Monitoring Board (RMB) for the United States and Canada includes an on-board modem. For the Avaya MSS in international markets, an external modem needs to be connected to the RMB.

Note:

For more information about remote access to the Modular Messaging system, see *Modular Messaging for the Avaya Message Storage Server (MSS) Configuration Release 3 Installation and Upgrades*.

Appendix C: Considerations with Message Networking server and Microsoft Exchange

The considerations presented in this Appendix apply only to Modular Messaging—Exchange. For information about the considerations for Modular Messaging—MSS, see [Modular Messaging—MSS and the Message Networking server](#) on page 189.

In this Appendix, Modular Messaging refers to Modular Messaging—Exchange unless stated otherwise.

Microsoft Exchange

Avaya Modular Messaging—Microsoft Exchange systems can interoperate with other messaging systems through a Message Networking server. However, such implementations might not provide full support to certain features on the networked systems. Customers and planners are advised to request and consult the following Message Networking engineering notes. These engineering notes are available on request.

- **Message Networking Implementation Notes**

Provides information about the implementation of Message Networking and the differences to consider for customers moving from a point-to-point network. Many of these issues impact messaging subscribers and must be discussed with customers prior to implementation.

- **Message Networking Directory Considerations**

Provides information about the implementation of Message Networking networked with Modular Messaging—Exchange. Addresses subscriber directory implementation required in such a configuration.

No support for Octel Analog Networking with Exchange 2007

Support for Octel Analog Networking will not be available in a native Exchange 2007 environment. Therefore, a voice network using Avaya Message Networking will not be possible in such environments. Octel Analog Networking requires an Exchange 2000/2003 Peer Mail Server to host the gateway. This Peer Mail Server must be the same Exchange server that hosts the Voice Mail Domain mailbox.

No blind addressing from the telephone user interface

When subscribers address messages to a remote recipient from the telephone user interface (TUI), subscribers can use the Numeric Address of the recipient, provided that the remote recipient is pre-administered as a remote subscriber on the Modular Messaging system

When addressing from a graphical user interface (GUI) client, subscribers can use the Network Address of the recipient.

Manual directory initialization

Modular Messaging does not support automatic directory updates from a Message Networking server. The directory entries on a Modular Messaging system for remote subscribers must be populated manually.

Alternatively, Modular Messaging administrators can extract the directory from Message Networking and import it into the global directory for Microsoft Exchange.

In addition, Modular Messaging subscriber records must be built on the Message Networking server. Some possible ways to add subscriber records are:

- Bulk adding subscribers by file

Use of File Transfer Protocol (FTP) to send a file to the Message Networking server. This file contains the numeric Network Addresses and e-mail addresses of Modular Messaging subscribers.

- Self-registration

Self-registration of each Modular Messaging subscriber on the Message Networking server. To self-register, subscribers send a voice name message to a predefined self-registration mailbox on the Message Networking server.

- Subscriber administration

Message Networking server administrators manually build the records of each Modular Messaging subscriber on the Message Networking server, using the administration screen interface.

No ongoing automatic directory updates

Modular Messaging does not support automatic directory updates from a Message Networking server. There is an ongoing need to manually synchronize the databases of Modular Messaging and Message Networking server. Whenever there is a change (add, delete, change) in any subscriber information, Message Networking and Modular Messaging databases require manual updates.

No voice name

For Modular Messaging subscribers, remote subscribers on the Message Networking server have a text-to-speech (TTS) name rather than a recorded voice name. When Modular Messaging subscribers address a message to a remote subscriber from the TUI, they hear the TTS name of that remote subscriber.

Double database entries on Modular Messaging

Currently, the Modular Messaging internal database stores two database entries for each subscriber. Of these entries, one entry is based on the subscriber telephone number, and the

other entry is based on the subscriber e-mail address. For example, for a certain subscriber, the two entries might be 303-555-1234 and subscriber@company.com.

When a Modular Messaging subscriber uses Dial-by-Name to address a message from the TUI, this internal database is referenced. When the subscriber spells the name of the recipient on the telephone keypad, the subscriber is given a choice between the two entries for the recipient. Modular Messaging renders the name of the recipient, using TTS conversion. However, because the TTS rendering of both the e-mail address entry and the name are the same, they appear to be duplicates.

Receiving or sending fax messages through Message Networking server

When Modular Messaging subscribers receive or send fax messages through a Message Networking server, the following fax types are not supported:

- Group 4 fax: The Message Networking server does not support Group 4 fax transcoding.
- Multistrip fax: A multistrip fax message is a fax with one or more pages, each stored as multiple strips of image data. Depending on its product version, Modular Messaging might generate multistrip fax messages. The Message Networking server does not support multistrip faxes.

Appendix D: Options set on a Class-of-Service basis

This appendix provides information about the various options that Avaya Modular Messaging administrators can set on a Class-of-Service (COS) basis.

A COS is a set of messaging capabilities that administrators define and assign to subscribers. At the time of installation, these Classes-of-Service contain the same default values. Administrators can then modify and rename Classes-of-Service to meet the requirements of subscribers. The Classes-of-Service report lists the current name and number for each COS.

A Modular Messaging—MSS system offers 512 Classes-of-Service.

A Modular Messaging—Exchange or Modular Messaging—Domino system offers 24 Classes-of-Service.

Avaya MSS

[Table 186](#) lists the various options that administrators can set on a COS basis for a Modular Messaging—MSS system.

Table 186: Classes-of-Service

Option set on a COS basis	Description
Message Retention Settings	
Retain New Messages	Specifies the number of days that messages in the New category are retained before being automatically removed by the system. The minimum and maximum values that this field accepts are 0 and 999 days, respectively.
Retain Saved Messages	Specifies the number of days that messages in the Saved category are retained before being automatically removed by the system. The minimum and maximum values that this field accepts are 0 and 999 days, respectively.
Mailbox and Message Sizes	
Maximum Mailbox Size	Specifies the maximum size of a subscriber mailbox. The default value is 16.41 Mbyte, which is 174 minutes with GSM encoding or 35 minutes with G.711 encoding. The maximum for this field is 64 megabytes (MB).
Maximum Call Answer Message	Specifies the maximum length of Call Answer messages that can be left for subscribers. The default value is 2.33 MB, which is 25 minutes with GSM encoding or 5 minutes with G.711 encoding.

Table 186: Classes-of-Service (continued)

Option set on a COS basis	Description
Maximum Voice Mail Message	Specifies the maximum size of voice mail messages that subscribers can create. The default value is 2.33 MB, which is 25 minutes with GSM encoding or 5 minutes with G.711 encoding.
Subscriber Features and Services	
Time Zone	Associates a time zone with the subscribers assigned this COS. Subscribers can override this setting by selecting an option other than Use System Default in Subscriber Options. The default for this field is Use System Time Zone.
Message Waiting Indication Allowed	Specifies whether a new message triggers Message Waiting Indication (MWI).
Call Me Allowed	Specifies whether subscribers can use the Call Me feature.
Find Me Allowed	Specifies whether subscribers can use the Find Me feature. The Find Me feature is unavailable with analog port cards.
Notify Me Allowed	Specifies whether subscribers can use the Notify Me feature.
Call Handling	Specifies whether subscribers can access Call Handling options. With Call Handling, subscriber can record alternative messages for different situations, such as busy or no answer. Call Handling also allows a subscriber to block all incoming calls.
Call Screening	Specifies whether subscribers can access the Call Screening feature. Call Screening requires callers to give their name before transferring from Automated Attendant to a subscriber mailbox.
Outbound Fax Calls	Specifies whether subscribers can forward a fax to a telephone number or fax machine.
Extended Absence Greeting Allowed	Specifies whether subscribers can record an Extended Absence Greeting (EAG).
Inbound Fax	Specifies whether subscribers can receive faxes.
Aria Date & Time Playback	Controls the inclusion of date and time information in the message playback. This can be set to Always, Never (the default), or under Subscriber control. This field is applicable only to subscribers using the Aria TUI.
Page via PBX	Specifies whether subscribers can use the Intercom Paging feature.

Table 186: Classes-of-Service (continued)

Option set on a COS basis	Description
Record Mailbox Greetings	Specifies whether subscribers can record the greetings that callers hear.
Caller Application Announcement Recording	Specifies whether subscribers can record prompts for Caller Applications.
Caller Application	Specifies the Caller Application to be used for inbound system calls to the primary Private Branch Exchange (PBX) extension for subscribers.
Telephone User Interface	Specifies the TUI to be used by all subscribers assigned this COS.
Restrict Client Access	Specifies whether subscribers are prevented from accessing their mailboxes using standards-based clients.
Personal Operator Configuration	Specifies whether subscribers are allowed to configure their personal operator settings.
Unsent Message Allowed	Specifies whether subscribers are allowed to use the Unsent Message feature.

Microsoft Exchange**IBM Lotus Domino**

[Table 187](#) lists the various options that administrators can set on a COS basis for a Modular Messaging—Microsoft Exchange or Modular Messaging—IBM Lotus Domino system.

Table 187: Modular Messaging Classes-of-Service

Option set on a COS basis	Description
Locate Messages Received	Allows subscribers to search for messages from a particular subscriber or Octel Analog Networking user.
Message Confirmation	Allows subscribers to view the date and time a recipient listened to a message and marked it as saved.
Send Messages	Allows subscribers to send voice messages from their mailboxes to other subscribers on the local voice mail system, on a remote voice mail system that supports Octel Analog Networking, or to any user on the electronic mail network.
Operator Access	Allows callers to transfer to an operator when they need live assistance. Administrators can set options for transferring calls to the receptionist or to a personal operator.

Table 187: Modular Messaging Classes-of-Service

Option set on a COS basis	Description
Dial by Name	Allows subscribers to search for an extension or mailbox number by spelling the person's name by using the telephone keypad.
TUI type	Assigns a TUI type to subscribers, either Aria (the default), AUDIX, or Serenade. This field is not applicable to Modular Messaging—Domino.
Timezone	Specifies the time zone appropriate to the location of the subscribers. This field is not applicable to Modular Messaging—Domino.
Date and time playback	Controls the inclusion of date and time information in the message playback. This can be set to Always, Never (the default), or under Subscriber control. This field is applicable only to subscribers using the Aria TUI. This field is not applicable to Modular Messaging—Domino.
Fax call answer	Specifies whether subscribers can accept an incoming fax call. This field is not applicable to Modular Messaging—Domino.
Personal Operator Configuration	Specifies whether subscribers are allowed to configure their personal operator settings.
Unsent Message Allowed	Specifies whether subscribers are allowed to use the Unsent Message feature.

Appendix E: Options set on a per-subscriber basis

This section provides information about the various options that Avaya Modular Messaging administrators can set on a per-subscriber basis.

Avaya MSS

Administrators of the Modular Messaging—Message Storage Server (MSS) can use the MSS Web administration pages to set subscriber attributes on a per-subscriber basis. [Table 188](#) lists these attributes. For more information on these attributes, see the MSS online help.

Table 188: Modular Messaging—MSS subscriber attributes

Attribute or Feature	Description
Name	Specifies the first name and last name of the subscriber.
Password	Specifies the default password the subscriber must use to log in to his or her mailbox. The password can be from one digit in length to a maximum of 15 digits.
Mailbox Number	Specifies assign a unique Mailbox Number to a subscriber's mailbox. A Mailbox Number can be between 2-digits and 10-digits in length. For more information, see Local mailbox numbers on page 176.
Numeric Address	Specifies a numeric address that is unique among all addresses in the voice mail domain (VMD). The Numeric Address can be from 1 to 32 digits and can contain the Mailbox Number.
PBX Extension	Specifies the primary telephone extension of the subscriber.
Class-of-Service	Subscribers can use this option to assign a Class-of-Service (COS) to a subscriber. The COS controls subscriber access to many features and provides general settings, such as mailbox size.
Community ID	Subscribers can use this option to assign a community identification (CID) number to a subscriber. Community IDs are used to control message sending and receiving among groups of subscribers.
ASCII Version of Name	If the subscriber name is entered in multi-byte character format, this field can be used to specify the ASCII translation of the subscriber name.
Immediately Expire Password?	Subscribers can use this option to determine if a subscriber's password must immediately expire. One situation where this field is useful is when changing ownership of a mailbox. This field has no effect if the Enable Password Expiry option is not selected on the Subscriber tab of the VMSC Telephone User Interface - Voice Mail Domain dialog box for the VMD in which this subscriber resides.

Table 188: Modular Messaging—MSS subscriber attributes

Is Mailbox Locked?	Subscribers can use this option to unlock a mailbox or to lock the mailbox and prevent access to it.
Backup Operator Mailbox	Specifies the mailbox number or transfer dial string of the subscriber's personal operator or assistant. This field specifies the transfer target when a caller to this subscriber presses 0 while listening to the subscriber's greeting.
Personal Operator Schedule	Specifies the Personal Operator schedule that determines when to route calls to the backup operator mailbox.
TUI Message Order	Specifies the order in which the subscriber will hear voice messages. The order can be Urgent Messages First, Oldest Messages First, or Newest Messages First.
Intercom Paging	Specifies the intercom paging setting for this subscriber. Settings include disable intercom paging, allow the subscriber to modify the setting, or allow the system to page the subscriber automatically.
VoiceMail Enabled	<p>Specifies whether the subscriber can receive messages from other subscribers, e-mail messages (if enabled), and Call Answer messages. Even if a subscriber is not voice mail enabled:</p> <ul style="list-style-type: none"> • The subscriber can use an e-mail or Web client to create, forward, and receive messages. • Other system users can use an e-mail or Web client to address messages to the subscriber. • The subscriber's information is displayed in the LDAP directory.
Secondary Extension	Subscribers can use these options to specify one or more alternate extension numbers for the subscriber. Secondary extensions can be used to specify a number for direct reception of faxes, to allow callers to this subscriber to use an existing Caller Application, or to identify each line appearance on the subscriber's telephone set if they have different telephone numbers.
Caller Application	Associates a Caller Application with a secondary extension. Callers who dial the extension experience the assigned Caller Application.

Table 189 lists the subscriber attributes options that administrators can set on a per-subscriber basis for a Modular Messaging—Microsoft Exchange or Modular Messaging—IBM Lotus Domino system. For more information on these attributes, see the MAS Administration Guide.

Table 189: Modular Messaging—Exchange and Modular Messaging—Domino subscriber attributes

Feature	Description
Enable Modular Messaging	Enables Modular Messaging for the selected subscriber.
Voice mail domain	This field displays the voice mail domain (VMD) that is being administered. If required, subscribers can use this option to move the subscriber to another VMD.
Extension number	Specifies the subscriber's primary extension number.
Options...	Specifies a secondary extension number for the subscriber. A secondary extension is an alternative number that might be used for direct reception of faxes, to allow callers to this subscriber to use an existing Caller Application, or to identify each line appearance on the subscriber's telephone set if they have different telephone numbers.
Mailbox number	Specifies the subscriber's mailbox number.
Numeric address	Specifies the subscriber's Numeric Address that uniquely identifies a subscriber in the organization. If the subscriber used Octel Analog Networking, the numeric address length must not exceed 10 digits.
Personal operator	Specifies a personal operator for the subscriber.
Mailbox number	Specifies the mailbox number of the subscriber's designated personal operator. When callers request operator assistance during the times that the personal operator mailbox is active, the system transfers them to the extension associated with this mailbox.
Schedule	Specifies the personal operator's schedule.
Class-of-Service	Assigns a Class-of-Service (COS) to the subscriber.
Require mailbox initialization at start of next subscriber session	Determines if the Mailbox Initialization feature is enabled for the subscriber.
TUI is locked due to failed logon attempts	Unlocks the TUI for a subscriber. A subscriber's TUI access can be locked due to failed logon attempts. Clear the checkbox to unlock the TUI for the subscriber.

Table 189: Modular Messaging—Exchange and Modular Messaging—Domino subscriber attributes

Allow call handling	Allows subscribers to use Subscriber Options to turn on the Call Handling feature.
Allow call screening	Allows subscribers to use Subscriber Options to turn on the Call Screening feature.
Allow intercom paging	Allows the subscriber to use the Subscriber Options to turn on the intercom paging feature.
Allow subscriber to edit announcements	Allows the subscriber to record and edit Caller Application announcements. If this option is enabled, subscribers can record announcements from the TUIs.
Allow Notify Me	Allows the subscriber to receive call notifications.
Allow Find Me	Allows the subscriber to use the Find Me feature.
Allow subscriber to edit greetings	Allows subscribers to edit personalized greetings, except the extended absence greeting (EAG).
Allow extended absence greeting	Allows subscribers to record an EAG.
Allow Call Me	Allows the subscriber to use the Call Me feature.
Allow Message Waiting Indicator	Allows the subscriber to use the message waiting indicator (MWI) feature.

Appendix F: MAS and MSS reports

Administrators can use the Reporting Tool application to generate predefined messaging application server (MAS) reports. These reports are useful for monitoring system usage, planning capacity, and tracking system security.

For more information about the Reporting Tool application, see [Reporting capabilities](#) on page 101.

To generate Message Storage Server (MSS) reports, administrators can use the Web based administrative interface. For more information, see [Message Storage Server administration](#) on page 99.

This appendix provides information about the Modular Messaging MAS and MSS reports.

Messaging Application Server reports

[Table 190](#) lists the MAS reports that administrators can generate by using Reporting Tool.

Table 190: MAS reports

Report	Description
Basic Metrics report	<p>Basic Metrics Report provides a general performance overview. This report records statistics, in the form of totals and percentages, on messaging activity in the voice mail domain (VMD). For example, the report includes the total number of incoming calls and the percentage of calls resulting in messages left.</p> <p>This report includes general information about telephone user interface (TUI) usage and statistical information about subscriber TUI logins.</p> <p>For a sample Basic Metrics report, see Figure 6.</p>
Hourly Statistics report	<p>Hourly Statistics Report assists in capacity planning. This report records information about the number of incoming and outgoing calls for each hour in a specified time period.</p> <p>This information is useful for monitoring call activity across the VMD.</p> <p>For a sample Hourly Statistics report, see Figure 7.</p>
Login Failures report	<p>This report records information about unsuccessful mailbox logins that involve the MAS. For example, an unsuccessful login from the TUI. Logins might be fail because of an incorrect password or invalid mailbox number being entered.</p> <p>This information is useful for monitoring system security for the VMD.</p> <p>For a sample Login Failures report, see Figure 8.</p>
Port Statistics report	<p>This report records incoming and outgoing call information for each port configured in the VMD.</p> <p>This information is useful for monitoring port usage.</p> <p>For a sample Port Statistics report, see Figure 9.</p>
System Usage report	<p>This report records call and messaging statistics for the VMD. This information is useful for monitoring the usage of the system, including the types of calls and their disposition; for example, the number of messages left, the number of fax calls, and the time that ports were used for text-to-speech (TTS) conversion of text messages.</p> <p>For a sample System Usage report, see Figure 10.</p>
User Mailbox Statistics report	<p>This report records information about telephone calls and messages received by each subscriber in the VMD.</p> <p>This information is useful for monitoring mailbox usage.</p> <p>For a sample Usage Mailbox Statistics report, see Figure 11.</p>

Message Storage Server reports

Avaya MSS

The MSS collects information about system settings and attributes and information that depicts how the system is used. This information includes data about features, subscribers, communities, and remote messaging traffic. This information is displayed in the MSS reports.

[Table 191](#) lists the MSS reports that administrators can generate by using the Web based administrative interface of the MSS.

Table 191: MSS Reports

Report	Description
Community Daily or Hourly Traffic report	<p>This report shows the total number of messages sent and received by each community.</p> <p>This report also shows the number of messages that were not sent or received by each community. Messages might not be sent because of restrictions on sending during any day in the last 32-day period or any hour in the last 7 days.</p> <p>For a sample Community Daily or Hourly Traffic report, see Figure 12.</p>
Feature Daily or Hourly Traffic report	<p>This report shows traffic information on a feature-by-feature basis. Features are divided into Call Answer features and messaging features.</p> <p>For a sample Feature Daily or Hourly Traffic report, see Figure 13.</p>
Load Daily or Hourly Traffic report	<p>This report shows daily load traffic information for 1 to 32 days or hourly traffic information for the last 7 days.</p> <p>Traffic load refers to the message traffic and storage relative to established mailbox thresholds.</p> <p>For a sample Load Daily or Hourly Traffic report, see Figure 14.</p>
Network Load Daily or Hourly Traffic report	<p>This report shows network channel traffic 1 day at a time for up to 32 days or 1 hour at a time for any hours within the last 7 days.</p> <p>This report can show any nodes that are exceeding specified threshold limits.</p> <p>For a sample Network Load Daily or Hourly Traffic report, see Figure 15.</p>
Remote Message Daily or Monthly Traffic report	<p>This report shows information about traffic loads between a local messaging system and a specified remote messaging system.</p> <p>For a sample Remote Message Daily or Monthly Traffic report, see Figure 16.</p>
Report of Classes-of-Service	<p>This report shows information about the current Classes-of-Service.</p> <p>For a sample Report of Classes-of-Service, see Figure 17.</p>

Table 191: MSS Reports (continued)

Report	Description
Report of Local Subscribers	<p>This report shows information about the current local subscribers. Information includes a count of the local subscribers, the number of local subscriber mailboxes in use, and the total number of subscriber licenses purchased for this system.</p> <p>This report also shows information about the number of other mailboxes that are administered to run system features, such as Enhanced Lists and Internet Messaging.</p> <p>For a sample Report of Subscribers, see Figure 18.</p>
Report of Remote Subscribers	<p>This report shows information about current remote subscribers administered on this system.</p> <p>For a sample Report of Remote Subscribers, see Figure 19.</p>
Report of Networked Machines	<p>This report shows information about the current networked machines.</p> <p>For a sample Report of Networked Machines, see Figure 20.</p>
Report of Trusted Servers	<p>This report shows information about the current trusted servers.</p> <p>For a sample Report of Trusted Servers, see Figure 21.</p>
Subscriber Daily or Monthly Traffic report	<p>This report shows traffic information about a specific subscriber for any day within the most recent 8-day period or any month within the last 13 months.</p> <p>This report can help administrators track a particular subscriber's mail-usage patterns.</p> <p>For a sample Subscriber Daily or Monthly Traffic report, see Figure 22.</p>
System Evaluation report	<p>This report is a Web administration page that provides a summary of various MSS settings and attributes.</p> <p>This report also shows information about dormant mailboxes. A dormant mailbox is a mailbox that has not been accessed in 30 days, or a new mailbox that has not received any messages in 30 days.</p> <p>For a sample System Evaluation report, see Figure 23.</p>

Report samples

Figure 6: Basic Metrics report

BASIC METRICS	
VMD-wide call and messaging statistics 1	
GENERAL INFORMATION	
<u>Total Incoming Calls:</u>	647
<u>Total Messages Processed:</u>	259
<u>Total Subscriber Logon (TUI) Attempts:</u>	334
<u>Total Subscriber Logon (TUI) Successes:</u>	328
ANALYSIS	
<u>Percentage of Incoming Calls resulting in Messages:</u>	40.03%
<u>Subscriber Logons (TUI) as a percentage of Incoming Calls:</u>	61.62%
<u>Completed Logons (TUI) as a percentage of Logon Attempts:</u>	98.20%
<u>Percentage of Failed Logon Attempts:</u> (Client hanging up and system failures)	1.20%
<u>Percentage of Subscriber Logon Failures:</u> (Incorrect PW or Incorrect Mailbox #'s)	0.60%

Figure 7: Hourly Statistics report

HOURLY STATISTICS				
Information on Incoming and outgoing calls 1				
<u>Date</u>	<u>Time Periods Starting</u>	<u>Incoming Calls</u>	<u>Failed Outgoing Calls</u>	<u>Outgoing Calls</u>
<u>2003/02/09</u>	11:00	17	0	26
	12:00	9	0	7
	13:00	23	1	14
	14:00	32	0	24
	15:00	27	0	35
	16:00	11	2	17
	17:00	6	1	5
	18:00	4	1	4
	19:00	2	0	6
	20:00	3	0	1
	21:00	2	0	3

Figure 8: Login Failures report

LOGIN FAILURES			
02/10/2003	Unsuccessful mailbox login attempts due to incorrect password		1
<u>Mailbox Number</u>	<u>Mailbox Name</u>	<u>Last Failed Login</u>	<u>Total Failed Logins</u>
1234	Paul Ryder	2003-02-10 13:08:34	1
5678	Marshall Raber	2003-02-09 14:11:22	1
9012	Penny Lee	2003-02-09 16:08:02	1
3456	J Frankel	2003-02-09 18:31:47	1
<u>Number of invalid mailbox numbers entered:</u>			4

Figure 9: Port Statistics report

PORT STATISTICS

2/23/2006

Information on each port configured in the VMD

INDIVIDUAL PORT STATISTICS

Server Name	Port Number	Incoming Calls	Outgoing Calls	Time Busy (seconds)	Percentage
DRWHO	1	919	0	32,292	1.3%
DRWHO	2	90	0	3,053	0.1%
DRWHO	3	7	0	114	0.0%
DRWHO	4	0	0	0	0.0%
DRWHO	5	0	0	0	0.0%
DRWHO	6	0	0	0	0.0%
DRWHO	7	0	0	0	0.0%
DRWHO	8	0	0	0	0.0%
DRWHO	9	0	0	0	0.0%
DRWHO	10	0	0	0	0.0%
DRWHO	11	0	0	0	0.0%
DRWHO	12	0	0	0	0.0%
DRWHO	13	0	0	0	0.0%
DRWHO	14	0	0	0	0.0%
DRWHO	15	0	0	0	0.0%
DRWHO	16	0	0	0	0.0%
DRWHO	17	0	0	0	0.0%
DRWHO	18	0	3	58	0.0%

Figure 10: System Usage report

SYSTEM USAGE		
02/10/2003	VMD-side call and messaging statistics	1
GENERAL CALL INFORMATION		
<u>Number of Incoming Calls:</u>		15
<u>Number of Times Users Logged On:</u>		1
<u>Time All Ports Busy (seconds):</u>		0
<u>Time All Text-to-Speech Ports Busy (seconds):</u>		1
<u>Number of Successful Transfers to Fax Gateway:</u>		0
<u>Number of Failed Transfers to Fax Gateway:</u>		1
CALLERS ACTIONS		
<u>Dialed Extension:</u>		4
<u>Defaulted to Assistance:</u>		1
<u>Dialed 0 for Assistance:</u>		1
<u>Left a Message for a Subscriber:</u>		4
<u>Pressed # to Logon:</u>		3
<u>Asked to Leave a Quick Message:</u>		2
INCOMING CALL SUMMARY		
<u>Due to Busy:</u>		2
<u>Due to RNA:</u>		2
<u>Direct Calls:</u>		2
<u>Diverted Calls:</u>		2
<u>Unknown Calls:</u>		2
OUTGOING CALLS SUMMARY		
<u>Number of Calls That Were Not Answered:</u>		1
<u>Number of Calls Placed to Busy Extensions:</u>		1
<u>Number of Calls that Got Connected:</u>		1
<u>Total Number of Outgoing Calls Excluding Calls to Clients:</u>		4
<u>Number of Failed Outgoing Calls Excluding Calls to Clients:</u>		2
<u>Number of Connected Outgoing Calls Excluding Calls to Clients:</u>		2
MESSAGE SUMMARY		
<u>Busy:</u>		1
<u>RNA:</u>		1
<u>Direct:</u>		1
<u>Subscriber:</u>		5
<u>Quick Message:</u>		1
<u>Transfer to Mailbox:</u>		1

Figure 11: Usage Mailbox Statistics report

USER MAILBOX STATISTICS								
9/27/2006			Mailbox Specific Statistics					
Mbox#	MailboxName	INCOMING CALLS TRANSFERRED TO EXT.	MESSAGES LEFT FOR USER					
			Ext. Busy	Ext. RNA	Direct	By Subscribers	Via QuickMsg	Via Xfer
7269	(Unknown Name)	0	2	2	0	4	0	0
6789	Client Test	0	0	0	0	0	0	0

Figure 12: Community Daily or Hourly Traffic report

Connected to zigzag.dr.avaya.com ssh

zigzag Active Alarms: w Logins: 1

list measurements community day 02/22/06 Page 1

COMMUNITY DAILY TRAFFIC

Date : 02/22/06 Ending Time : 23:59

Number of Voice Mail Messages				
Community ID	Sent by	Received by	Not Sent by	Not Received by
1	2743	2743	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0

Press [NextPage], [PrevPage] or [Cancel]

enter command: list measurements community day 02/22/06

Cancel Refresh Enter ClearFld Help Choices NextPage PrevPage

Figure 13: Feature Daily or Hourly Traffic report

```

Connected to zigzag.dr.avaya.com ssh
zigzag      Active      Alarms:  w      Logins: 1
list measurements feature day 02/22/06      Page 1
FEATURE DAILY TRAFFIC
Date : 02/22/06      Ending Time : 23:59

REMOTE SUBSCRIBERS      Administered: 0      Non Administered: 1
VOICE MAIL
Total Messages,      Sent: 2743      Current: 477
Voice Components,      Sent: 2742      Current: 438
FAX Components,      Sent: 0      Current: 0
Binary Attachments,      Sent: 0      Current: 30
Text Components,      Sent: 2743      Current: 477
Broadcast Messages,      Sent: 0      Current: 0
Log-in Announcements,      Sent: 0      Current: 0
Urgent Messages,      Sent: 0      Current: 0
Private Messages,      Sent: 0      Current: 0
Avg. Storage Time: 435

CALL ANSWER
Total Messages,      Received: 434      Current: 497
Voice Components,Received: 429      Current: 492
FAX Components,      Received: 0      Current: 0
Avg. Storage Time: 0

Press [NextPage], [PrevPage] or [Cancel]
enter command: list measurements feature day 02/22/06
Cancel Refresh Enter ClearFld Help Choices NextPage PrevPage

```

Figure 14: Load Daily or Hourly Traffic report

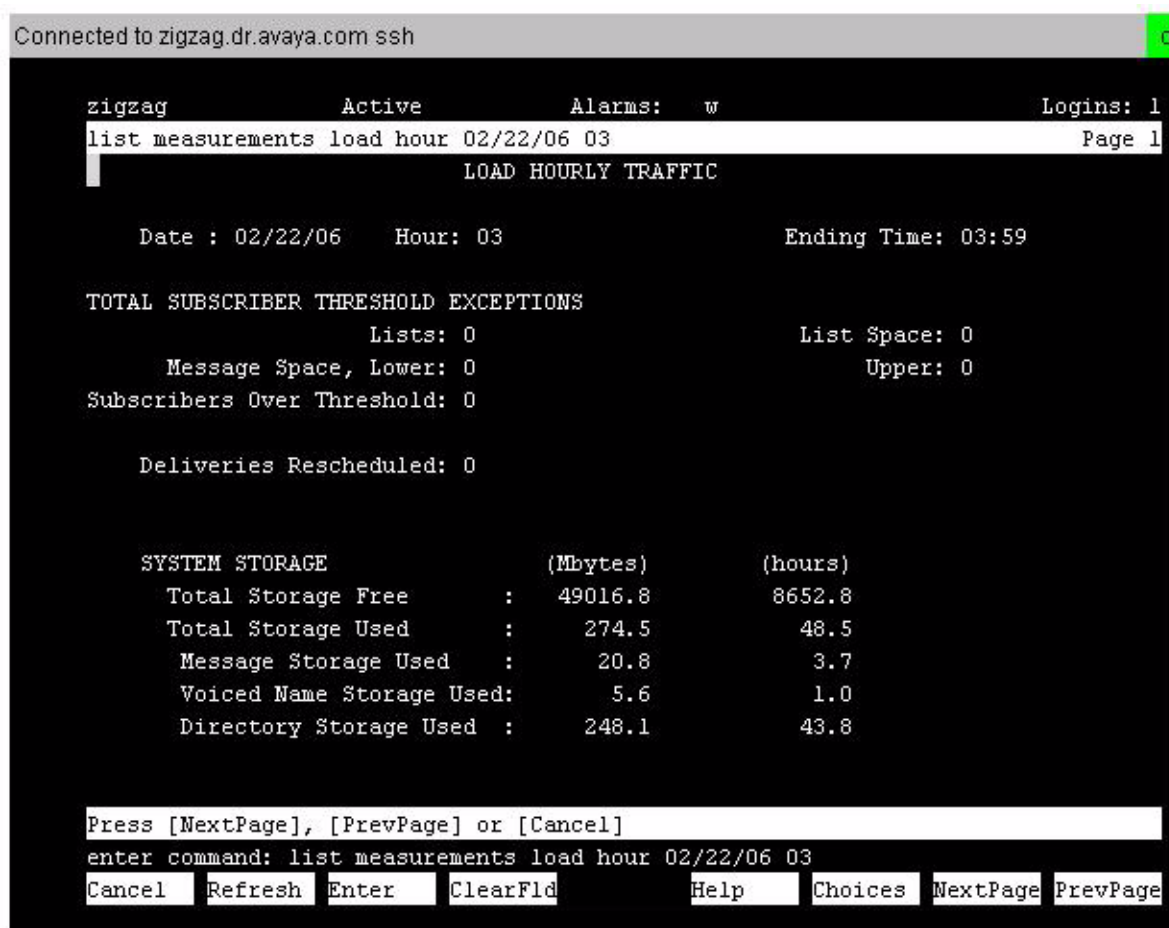


Figure 15: Network Load Daily or Hourly Traffic report

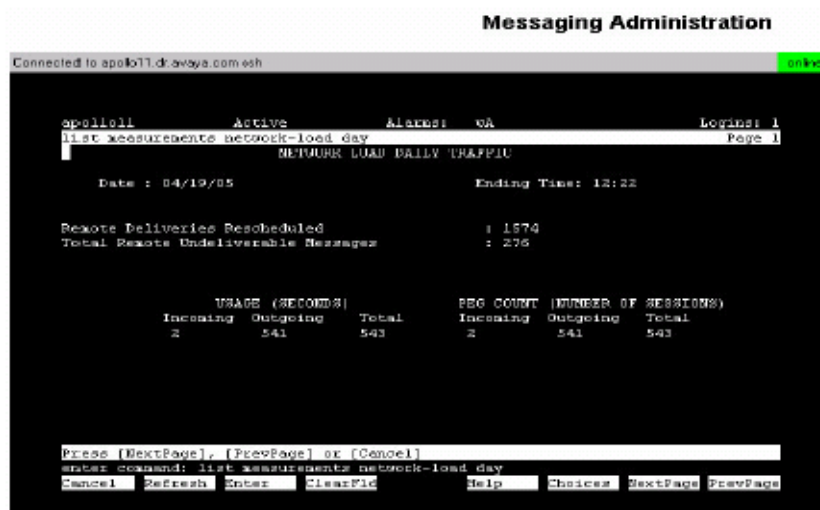


Figure 16: Remote Message Daily or Monthly Traffic report

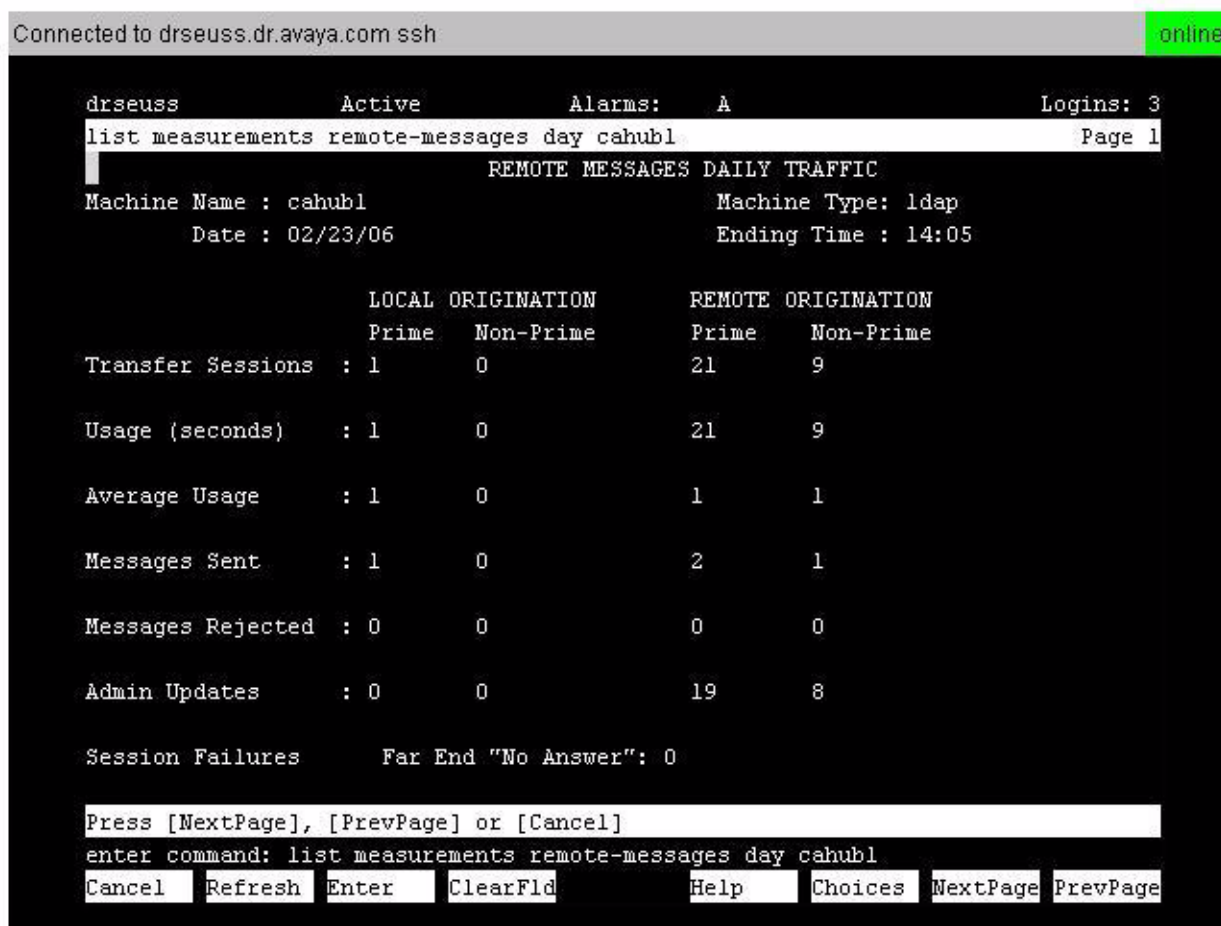


Figure 17: Report of Classes-of-Service

Report of Classes-of-Service	
<hr/>	
Server Name: arnala.outland.avaya.com	Number of Classes-of-Service: 512
<hr/>	
<u>COS Name</u>	<u>COS Number</u>
class00	0
class01	1
class02	2
class03	3
class04	4
class05	5
class06	6
class07	7
ELA	8
class09	9
class10	10
class11	11

Figure 18: Report of Local Subscribers

Report of Local Subscribers								
Subscriber Licenses Used: 2533 of 20000			Total Subscribers: 2535					
System Mailboxes: 2			Filtered Subscribers: 2535					
Subscriber Name	Mailbox Number	Numeric Address	COS	CID	Miscellaneous 1	Miscellaneous 2	Miscellaneous 3	Miscellaneous 4
Abhisheet	10032	1810032	0	1				
Abhisjit	10010	1810010	0	1				
Asawari	10012	1810012	0	1				
Ashwini	10030	1810030	0	1				
Anish	10015	1810015	0	1				
Biswas, Swarnendu	10019	1810019	0	1				
Chaitanya	10027	1810027	0	1				
Chander	10033	1810033	0	1				
Cherry	10017	1810017	0	1				
Desai, Satyajit	10024	1810024	0	1				
Devayani	10020	1810020	0	1				
FAX	10098	1810098	0	1				

Figure 19: Report of Remote Subscribers

Report of Remote Subscribers				
Remote Machine: internet		Total Subscribers: 7		Filtered Subscribers: 7
Subscriber Name	Machine Name	Mailbox Number	Numeric Address	Community
Bryce Billinger	internet			1
Mail Delivery Subsystem	internet			1
-	internet			1
Joe Blow	internet			1
Mail Delivery Subsystem	internet			1
Rock Block	internet			1
ExternalCaller(VVS1)	internet			1
<div>BackReturn to MainHelp</div>				

Figure 20: Report of Networked Machines

Report of Networked Machines						
Machine Name	IP Address	Machine Type	LDAP Port	Updates In	Updates Out	Total Subscribers
arnala	198.152.137.83	local	56389	no	no	0
<div>BackReturn to MainHelp</div>						

Figure 21: Report of Trusted Servers

Report of Trusted Servers		
Trusted Server Name	IP Address	Service Name
This messaging server currently has no trusted servers.		
<div>BackReturn to MainHelp</div>		

Figure 22: Subscriber Daily or Monthly Traffic report

Messaging Administration		
Connected to magneto.d.aveya.com ssh online		
magnet0	Active	Alarm: noA
list measurements subscriber day 81310		Login: 1
SUBSCRIBER DAILY TRAFFIC		Page 1
Name: Hayes, Grace E Mailbox #: 81310 City ID: 1		
Date: 04/19/05 Ending time: 12:19		
Mailbox Space Used: 0.00 (0 minutes)		
Space Allowed: 16.48 (35 minutes)		
Maximum Space Used: 0.00 (0 minutes)		
VOICE MAIL MESSAGES RECEIVED		
Local Mail Messages		
Voice Components: 0		
FAX Components: 0		
Binary Attachments: 0		
Text Components: 0		
Remote Mail Messages		
Voice Components: 0		
FAX Components: 0		
Binary Attachments: 0		
Text Components: 0		
Undeliverable Notifications: 0		
Press [NextPage], [PrevPage] or [Cancel]		
Enter command: list measurements subscriber day 81310		

Figure 23: System Evaluation report

System Evaluation Report

System Status

System Status: UP

Site Information

Name of Business: unknown

Phone Number: unknown

Installation Location Number (IL): unknown

Software Summary

Software Release: 2

Extension Ranges

Node ID	Dial Prefix	Starting Extension	Ending Extension
0		10700	10799
0		35099	35099
0		35100	35999
0		36000	36999
0		37000	37999
0		99998	99999
0		80000	80005
2	5	0000000000	5332210499
2	5	5332210600	9999999999
4		10500	10599

Dormant Mailboxes

Subscriber Name	Mailbox Number	Switch Number	Last Access
Postmaster, Apollo11	99999	1	1969-12-31 17:00:00
Postmaster, Apollo11	99999	1	1969-12-31 17:00:00

File System Usage

File System	Type	1024 Blocks	Used	Available	Capacity	Mounted On
/dev/md1	ext3	2118732	762440	1248664	38%	/
/dev/md6	ext3	5036160	332128	4448208	7%	/backup
/dev/md0	ext3	23239	5671	15368	26%	/boot
/dev/md5	ext3	2015952	32916	1880628	2%	/msg/add-on1
/dev/md4	ext3	2213560	121880	1979232	6%	/msg/database
/dev/md7	ext3	25197164	885404	23031788	4%	/msg/media1
/dev/md8	ext3	24193420	157932	22806524	1%	/msg/media2
/dev/md9	ext3	12096632	47112	11435040	1%	/msg/media3
/dev/md3	ext3	1003960	103864	849096	11%	/msg/software
none	tmpfs	257504	0	257504	0%	/dev/shm

Installed Software Packages

Package Name	Version	Description	Install Date
A1312rf+d	1.3-12	Remote Field Update D for 1.3-12: various fixes	Thu Apr 14 10:39
APPLset	1.3-12	Messsage Core Application Set	Wed Mar 23 23:43
asg	6.0-66	Messsaging Access Security Gateway Package	Wed Mar 23 23:41
audixed	v2.0-32.2	Avaya (TM) Modular Messaging - CD Versioning Package	Wed Mar 23 23:41
AUDIXtune	6.0-66	Messaging Platform Tuning	Wed Mar 23 23:41
cdhstub	6.0-66	Messaging CDH Stub Package	Wed Mar 23 23:41
cpucmos	6.0-66	CMOS Tools Package	Wed Mar 23 23:41
cshttps	6.0-66	CornerStone Https Package	Wed Mar 23 23:41
cswebadm	6.0-66	Messaging Web Administration Package	Wed Mar 23 23:41
E1312rf+a	1.3-12	Remote Field Update A for 1.3-12: sysval	Wed Mar 23 23:43

[Return to Main](#)
[Re-run System Report](#)
[Help](#)

Glossary

Active Directory	The directory service for a Microsoft Windows 2000 or Windows 2003 Server. The Active Directory stores information about objects on the network and makes this information available for authorized administrators and users. It provides administrators with an intuitive hierarchical view of the network and a single point of administration for all network objects.
AHT	See average hold time .
Automated Attendant	The system Automated Attendant that greets callers and instructs them on how to proceed. Automated Attendant is <i>not</i> the same as Caller Applications. Avaya Modular Messaging Caller Applications can be customized to perform functions similar to Automated Attendant and nested Automated Attendant in other systems, such as AUDIX.
Avaya Modular Messaging Voice Form	An application that provides access to voice messages from the Microsoft Outlook or IBM Lotus Notes e-mail application. Through voice forms, subscribers can perform standard voice mail functions, such as listening to, replying to, or forwarding voice messages, or composing new voice messages using their desktop computers or telephones.
Avaya Modular Messaging Voice Recorder	A tool for recording voice mail and voice-annotated items, such as Microsoft Word documents. It provides a way to send a quick voice message without having to start an e-mail application.
average hold time	The sum of the lengths of all telephone calls (in minutes or seconds) during the busiest hour of the day divided by the number of calls.
BDL	See Broadcast Mailbox Agent (BMA) .
blind transfer	See unsupervised transfer .
broadcast	A Modular Messaging—Avaya Message Storage Server (MSS) feature in which a message that is received into an appropriately configured enhanced-list mailbox is sent to all local subscribers and to all list members.
Broadcast Mailbox Agent (BMA)	A feature that associates one mailbox, Broadcast mailbox, to a special distribution list of members, Broadcast Distribution List, so that when subscribers want to send a message to the whole list, they can send a message to the Broadcast mailbox instead. BMAs are supported only by Modular Messaging—Microsoft Exchange systems.
busy hour	Used to calculate the number of ports required when sizing a system. It represents the hour of the day when the volume of calls generated by internal subscribers and external callers reaches its peak.
Call Answering	Also known as telephone answering. This is the sequence of events that enable the voice mail system to answer calls on behalf of a subscriber if the line is busy or if the subscriber does not answer.

Glossary

Call Me	A feature that allows subscribers to be called at a designated telephone number or from a telephone list, each time they receive a message that meets specified criteria. The subscriber is then invited to log in to Avaya Modular Messaging to review the message. Subscribers can set up Call Me rules in Subscriber Options.
call screening	A Call Answering option that requires callers to announce themselves before a subscriber answers the call. If a call is screened and the subscriber is not available to answer it, the caller has the choice of leaving a message or being forwarded to a different extension or to the operator.
Caller Applications	Extensions to the Avaya Modular Messaging telephone user interface (TUI) used to customize how Avaya Modular Messaging interacts with callers.
Caller Applications Editor	An Avaya Modular Messaging tool that customizes the Microsoft Management Console (MMC) user interface to permit the creation, editing, and deployment of Caller Applications.
canonical addressing	<p>A method of addressing that specifies the full location, including country code and area code, in the following order:</p> <p>+CountryCode [(AreaCode)] SubscriberNumber</p>
carried traffic	The total busy hour traffic offered to the group of ports, minus the blocked calls.
CCI	See CCS .
CCS	See Common Channel Signaling (CCS) .
Centum Call Second	A unit of measurement for call time. The formula for a CCS is the number of calls per hour multiplied by their average duration in seconds, all multiplied by 100. 36 CCS = 1 Erlang.
Class-of-Service	A category used to determine subscriber access to system options and features. The administrator assigns a COS to each subscriber.
cluster	A group of two or more Domino servers that are set up to provide users with constant access to data, balance the workload among servers, improve server performance, and maintain performance when the size of an organization increases.
codec	A system of compressing uncompressed digital data so that the data uses less memory.
Common Caller Interface (CCI)	An interface that allows callers to leave Call Answer messages. This interface is common to all callers irrespective of the TUI assigned to the called subscriber.
Common Channel Signaling (CCS)	A digital signaling method that uses one or more channels to transmit signaling information to control and manage other channels in the trunk.
community	A community is a group of subscribers to whom administrators can assign some type of calling restrictions. The administration of communities enables administrators to further define the allowed call destinations of subscribers. The Modular Messaging system provides up to 15 communities.

Coordinated Universal Time (UTC)	A time scale based on Universal Time (UT) or Greenwich Mean Time.
COS	See Class-of-Service .
Data Collection Tool (DCT)	A tool that queries an MAS to collect information that is required for an upgrade or catastrophic disk failure recovery. The tool puts the MAS information in to a data file.
DCT	See Data Collection Tool (DCT) .
DEM	See Directory Enabled Management (DEM) .
DHCP	See Dynamic Host Configuration Protocol (DHCP) .
Dial-by-Name	A method of addressing that enables a subscriber to spell the name of a recipient on the telephone keypad when using the TUI. It is also a method of using directory assistance from Automated Attendant to call an extension.
DID	See Direct Inward Dialing .
Direct Inward Dialing	Using DID, a caller can dial inside an organization to reach a telephone extension directly without going through a receptionist.
Digital Set Emulation (DSE)	A digital protocol that is used to connect digital telephones to switches in order to emulate digital telephone sets. Also known as Set Emulation.
Directory Enabled Management (DEM)	An interface that uses Avaya Directory Server to facilitate administration of Modular Messaging—MSS from a centralized location.
Domino Administrator	Client software that administrators use to perform administration tasks, such as setting up and managing users and servers.
Domino domain	A collection of Domino servers and users that share a common Domino Directory. User domains are determined by the location of their server-based mail files. For a Domino server to communicate with a server in a different domain, create a Domain document in the Domino Directory to define the name, location, and access to the other domain.
DSE	See Digital Set Emulation (DSE) .
DTMF	See Dual-Tone Multifrequency (DTMF) .
Dual-connect	A mode in which a Modular Messaging Microsoft Outlook Client or a Modular Messaging Restricted Outlook Client subscriber uses the computer for command and control and uses the telephone for listening to and recording a message.
Dual-Tone Multifrequency (DTMF)	A combination of two tones that uniquely identify each button on a telephone keypad.
Dynamic Host Configuration Protocol (DHCP)	A protocol that dynamically assigns IP addresses to devices when they get connected to the network.
EAG	See Extended Absence Greeting (EAG) .

Glossary

E1	A digital transmission link with a capacity of 2.048 megabits per second (mbps). This is the standard for primary rate connections outside North America.
ELA	See Enhanced-list application (ELA) .
Enhanced-list application (ELA)	A feature that associates one mailbox to a list of members so that when subscribers want to send a message to the whole list, they can send a message to the list mailbox instead. ELAs are supported only by Modular Messaging—MSS systems.
Erlang	A unit of measurement for call time. One Erlang is equivalent to 60 call minutes or 36 Centum Call Seconds. See also Centum Call Second .
event	A significant occurrence in a voice mail system that is of interest to an administrator for diagnostic or reporting purposes.
Extended Absence Greeting (EAG)	A subscriber recorded greeting that is played to the caller when the subscriber is away from office and has no access to messages.
fax routing address	An e-mail address consisting of a string of digits that uniquely identify the subscriber to the fax server.
Find Me	A feature that enables a subscriber mailbox to redirect unanswered calls to a list of telephone numbers. Calls are directed to each telephone number in the list unless the subscriber answers. Subscribers can set up rules for using Find Me in Subscriber Options. Find Me is not supported for analog integrations.
G.711	An audio-encoding format with a coding rate of approximately 64 kilobits per second (kbps) or 8 Kilobytes per second (KBps).
Global System for Mobile Communications (GSM)	An audio-encoding format with a coding rate of approximately 13 kbps or 1.6 KBps.
GOS	See Grade of service .
Grade of service	The probability, expressed as a percentage of callers who call during the busy hour, that an incoming call is delayed (the caller hears multiple rings) because all ports are in use. When calls are queued on the switch, the call is eventually answered if the caller does not hang up. P.05 means that the caller has a 5% chance of hearing a busy signal.
GSM	See Global System for Mobile Communications (GSM) .
H.323 integration	With H.323 integration with the Avaya Communication Manager, signaling information, Message Waiting Indicator (MWI) information, and voice data are transmitted over the IP network.
hunt group	A group of telephone lines in which the incoming calls are distributed according to a priority scheme.
IMAP4	See Internet Messaging Access Protocol 4 (IMAP4) .
inband signaling	A method of connecting the messaging application server to the switch as if it were a series of single-line telephones or a series of trunks in a hunt group. The term inband is used because all the call-identification information is passed

	from the switch to the messaging application server (MAS) using DTMF signals on the same line as the voice connection.
Intercom paging	A method of automatically paging subscribers if they do not answer their telephones. Once subscribers are paged, they must return to their telephones to pick up the call. If subscribers do not respond to the page, the system transfers the callers to their mailboxes. Modular Messaging supports station-level paging. For Modular Messaging to be able to support trunk-level paging, customers are required to provide additional hardware between Modular Messaging, the switch, and the paging system.
Internet Messaging Access Protocol 4 (IMAP4)	A method of accessing electronic mail or bulletin board messages that are kept on an e-mail server. Client e-mail applications can use IMAP4 to access remote message stores as if they were local.
IP telephony	The use of networks running IP to send and receive messages, such as voice data.
LDAP	See Lightweight Directory Access Protocol (LDAP) .
Lightweight Directory Access Protocol (LDAP)	LDAP is an IP used to retrieve and manage directory information.
local mailbox number	A method of addressing messages to recipients within the voice mail domain.
MAS	See messaging application server (MAS) .
Message Storage Server (MSS)	An Avaya-produced message store that is an internal part of the Modular Messaging—MSS system. All new installation of Modular Messaging Release 3 reside on the Avaya S3500 platform with a Linux operating system (OS). The MSS software of the upgraded Modular Messaging releases can reside on the Avaya S3400 platform with a Linux OS.
messaging application server (MAS)	The voice server that provides an interface between the message store (and directory) and the telephone system.
Message Waiting Indicator (MWI)	A method of alerting subscribers when messages meeting specified criteria arrive in their mailboxes. Subscribers are alerted by either a lamp indicator on their telephone or an audible tone (stutter dialtone) when they pick up the receiver. The indicator is cleared when the message is opened in the e-mail client or saved or deleted using the TUI. Subscribers can set up rules for using MWI in Subscriber Options. For example, they may choose to be notified only when they receive urgent voice messages.
MIME	See Multipurpose Internet Mail Extensions (MIME) .
Microsoft Exchange site	A group of Microsoft Exchange servers, where one or more servers on a high-bandwidth, permanent local area network (LAN) work together to provide messaging and other services to a set of users. Within an Exchange site, users can share information and can be managed as a collection. A Microsoft Exchange site can be mapped to the Windows domain topology that has

Glossary

	already been established. It can also span multiple trusted Windows domains that already exist.
Microsoft Management Console (MMC)	A presentation service for management applications.
MMC	See Microsoft Management Console (MMC) .
multimedia computer	A computer with multimedia capabilities. A computer has multimedia capabilities if it has a sound card, microphone, and speakers or headphones.
Multipurpose Internet Mail Extensions (MIME)	A specification for formatting non-ASCII messages so that they can be sent over the Internet. Many e-mail clients now support MIME, which enables them to send and receive graphics, audio, and video files through the Internet mail system. In addition, MIME supports messages in character sets other than ASCII.
MWI	See Message Waiting Indicator (MWI) .
name prompt	A personalized prompt that states the name of a subscriber when the extension of that subscriber is busy or unanswered and he or she has not recorded a personal greeting.
Notify Me	With Notify Me, subscribers can use e-mail, a pager, short message service (SMS)-enabled digital telephone, or other device to notify them of calls to their Avaya Modular Messaging inbox.
Notes client	Client software that provides access to Notes databases on a Domino server and allows them to send mail and browse the Web.
Numeric Address	A string of digits that uniquely identifies a recipient across the organization. A Numeric Address is used by the TUI to address a message.
offered traffic	The total traffic offered to a group of ports during the busy hour, including calls that are blocked.
Offline Call Answer Store	A repository to which every MAS in a multi-MAS voice mail domain migrates offline Call Answer messages.
operation history database	A temporary storage area for events generated by Modular Messaging. The Operation History Viewer is used for viewing events in this database.
Operation History Viewer	A diagnostic tool that displays events generated by Modular Messaging activity and logged in the Avaya Modular Messaging operation history database. By creating a session, administrators can restrict the number of events to only those that meet their criteria. They can view live events as they are added to the operation history database or view historical events.
operator	The person to whom callers are transferred when they request to speak with an operator, exceed the maximum number of errors permitted on the system, or call from a rotary telephone. Individual mailboxes might have an operator that is different from the designated system operator, for example, a personal assistant.

optional greeting	A personalized message for greeting callers if the extension of a subscriber is busy or unanswered, or if incoming calls are blocked.
Outlook Web Access (OWA)	A Microsoft provided client for Microsoft Exchange Server. The client provides a single interface for access to voice mail and corporate e-mail messages stored in the Exchange message store.
OWA	See PDL .
PDL	See Personal Distribution List (PDL) .
POP3	See Post Office Protocol 3 (POP3) .
password	A number required by subscribers to gain access to Modular Messaging through different interfaces, such as the TUI, desktop computer interfaces, and the Unified Communication Center (UCC) Speech Access Client. Subscribers can change their passwords by using the TUI or Subscriber Options.
PBX	See Private Branch Exchange (PBX) .
PBX integration	A method that establishes communication between the switch and the voice mail system. The switch supplies information, such as the identity of the caller who is calling on internal calls and the extension that the caller is trying to reach. Also known as switch integration.
PCI	See Peripheral Component Interconnect (PCI) .
PEL	See Privacy Enforcement Level (PEL) .
Peripheral Component Interconnect (PCI)	A standard for connecting peripherals to a personal computer. PCI is supported by most major computer manufacturers.
Personal Distribution List (PDL)	A labeled collection of addresses that subscribers create and save for use later. Messages that subscribers address to the list are sent to all the multiple addresses (list members) within the list. Subscribers can manage and address messages to only those PDLs that they create and own.
personal greeting	A personalized prompt that greets callers when they are transferred to a subscriber mailbox when the extension is busy or not answered.
pilot number	A single number that presents a call to one of the available ports within a hunt group.
Please Hold prompt	A personalized prompt that informs callers that they are on hold while being transferred to an extension.
Port Monitor	A diagnostic tool that provides a graphical user interface (GUI) for checking and changing the status of ports on a particular MAS.
Post Office Protocol 3 (POP3)	An Internet access protocol that is used to retrieve e-mails from an e-mail server. Clients using POP3 typically connect briefly to the server to download any new messages and store them on the subscriber computer.
Privacy Enforcement Level (PEL)	A system-wide privacy parameter that determines the level of privacy the system enforces. The PEL setting determines which clients or interfaces have

Glossary

	access to Modular Messaging mailboxes, and the level of restriction imposed on recipients of private messages.
Private Branch Exchange (PBX)	A telephone exchange local to a particular organization that uses, rather than provides, telephone services. Also known as a switch.
prompt	A spoken greeting or instruction that directs callers whose calls have come through Automated Attendant.
Personal Operator	A designated extension or mailbox to which the system can transfer callers for assistance when the original call was not answered. Other terms have been used including "personal assistant", "covering extension", "operator", "zero-out destination", etc.
Public Switched Telephone Network	A common carrier network that provides circuit switching between public users.
Q.Signaling (QSIG)	A protocol for ISDN-based inter-switch signaling based on the European Q.931, Q.9212, and DPNSS protocols.
QSIG	See Q.Signaling (QSIG) .
replication	The process of exchanging modifications between replicas. Through replication, Domino makes all of the replicas essentially identical over time.
Reporting Tool	A tool for generating reports for monitoring voice mail system usage, planning capacity, and tracking security. Once a report is generated, it can be viewed on screen or printed for easy reference. It can also be exported to many popular file formats or attached to a message sent through a MAPI-enabled e-mail system.
Restrict Client Access COS	A COS parameter that enables or restricts client access to Modular Messaging mailboxes.
Secure Sockets Layer (SSL)	A protocol for transmitting private documents or messages through the Internet.
Sending Restrictions	A Modular Messaging—MSS feature that prevents the delivery of messages from certain originators to specific groups of mailboxes residing within the Modular Messaging system.
Session Initiation Protocol (SIP)	A signaling protocol that allows exchange of information, such as call information, signaling information, and voice data using voice channels through the LAN.
Simple Mail Transfer Protocol (SMTP)	A TCP/IP protocol used for sending and receiving e-mail. Most e-mail systems that send mail over the Internet use SMTP to send messages from one server to another and to send messages from an e-mail client to an e-mail server.
Simplified Message Desk Interface (SMDI)	A protocol that is used for sending switch integration data. This protocol does not require a caller to re-enter the telephone number if the extension is busy or not answered.
Simple Network Management Protocol (SNMP)	A protocol for managing and monitoring networks.

Single-connect mode	A mode in which a Modular Messaging Outlook Client or a Modular Messaging Restricted Outlook Client subscriber plays or records messages by means of a multimedia computer.
SIP	See Session Initiation Protocol (SIP) .
SMTP	See Simple Mail Transfer Protocol (SMTP) .
SNMP	See subscriber .
SSL	See Secure Sockets Layer (SSL) .
subscriber	A user whose profile is enabled for voice messaging. A subscriber can use both the TUI and the GUI of Modular Messaging.
Subscriber Options	An application that allows subscribers to configure their mailboxes by using their computers. Subscribers can record all personal greetings and prompts, personalize their call handling options, and select whether to use multimedia or telephone for recording and playing back voice messages.
supervised transfer	A call transfer that occurs when the voice mail system monitors call progress during a transfer. The transfer is completed only if it will be successful.
switch	See Private Branch Exchange (PBX) .
Tag Image File Format (TIFF)	A widely used file format for storing image data. TIFF is supported by several image-processing applications.
Telephone answering	Also known as Call Answering. This is the sequence of events that enable the voice mail system to answer calls on behalf of a subscriber if the line is busy or if the subscriber does not answer.
telephone user interface (TUI)	An interface through which callers and subscribers can gain access to the Modular Messaging system by means of the telephone. The TUI is an Automated Attendant and voice-messaging system that controls call handling. It greets incoming callers and instructs them on how to proceed.
text-to-speech (TTS)	The conversion of text into speech (speech synthesis). Using TTS, Modular Messaging subscribers can listen to the envelope information of messages, text names, and e-mail messages over the telephone.
TIFF	See Tag Image File Format (TIFF) .
Tracing Service	A separate Modular Messaging service that records operational information about activity in the voice mail domain.
transaction database	A storage area where voice-messaging events happening in the voice mail domain are written. It is a permanent database containing summary information that is used by the Reporting Tool.
TTS	See text-to-speech (TTS) .
TUI	See telephone user interface (TUI) .
T1	A connection with a digital transmission link of 1.544 mbps.
UCC	See Unified Communication Center (UCC) .

Glossary

Unified Communication Center (UCC)	An Avaya provided speech access client for Modular Messaging—MSS. It provides speech access and voice control of corporate e-mail and voice mail messages through a speech user interface.
unsupervised transfer	A call transfer that occurs when the voice mail system does not monitor the call progress and completes the transfer regardless of the destination of the call. Known also as a blind transfer.
UTC	See Coordinated Universal Time (UTC) .
Visual Voice Editor	An administration tool that allows the recording of customized prompts used by Modular Messaging. The tool allows recording using multimedia or the TUI. When modifying a prompt, users are presented with a graphical rendering of the sound, which allows precise editing of the audio data.
VMD	See voice mail domain (VMD) .
VMSC	See Voice Mail System Configuration (VMSC) .
voice mail domain (VMD)	A group of MAS units that share a common set of properties, using one or more message stores. All subscribers who are provided with telephone answering by these MAS units belong to the same VMD.
Voice Mail System Configuration (VMSC)	An administration tool used to configure the attributes of a VMD or group of MAS units.
voice player	A component of the Avaya Modular Messaging Voice Form used for playing back and recording voice messages.
voice port	A telephone end-point provided by installing voice cards on the MAS. With H.323 integration, voice ports are equivalent to voice channels over the IP connection.
.WAV	A file extension used for Windows multimedia format audio data.

Index

A

Active Directory	
Global Catalog server	247
Microsoft Exchange Server	51
addressing	
Dial-by-Name.	177
fax messages	201
local mailbox number	176
network address	178
numeric address	176
PDLs	141
primary mailbox address	174
secondary extension	186
Administration	
Call Answer responses	183
creating dialing rules.	184
creating mapping tables	184
Caller Applications Editor	59
Exchange and Domino versions	36
MSS version	35
Alarms and logs	
MAS	120
MSS	121
anti-virus software	22
Audible Hourglass prompt	68
audio encoding	126
binary size	128
considerations	126
G.711 definition.	127
GSM definition	126
MIME transfer size	128
recommendations.	127
Automated Attendant	
introduction.	56
scheduling	57
Avaya Client Add-in	
Service providers	75 , 85
Subscriber Options	88
Voice Form.	73 , 78 , 84
Voice Recorder.	75 , 79 , 85

Avaya Common Caller Interface	
description	57
options	58
Avaya Integrated Management	100
Avaya Message Servers	23
Avaya MSS	
administration	99
alarms and logs	121
backup capabilities	
back up to DVD-RAM.	160
back up to LAN	161
backup media type	158
backup types	158
description.	158
broadcast	134
communities and sending restrictions	130
configurations	51
description	50
ELA	132
Fax Sender Service	46
features and capabilities	108
Mailbox Manager	99
message networking server	189
Modular Messaging IBM Lotus Notes Client	84
Modular Messaging Microsoft Outlook Client	72
Service Providers	75 , 79 , 85
standards-based clients	96
voice mail domain design rules	244
Avaya Outlook Client	
Service providers	79

B

Broadcasting messages	
comparison	110
description	134
Modular Messaging Exchange version	135
Broadcast Distribution List (BLD)	134
Broadcast Mailbox Agent (BMA).	135
MSS	134
broadcast mailbox	134
ELA	134
enhanced-list mailbox	134
enterprise-wide broadcast lists	134
busy hour	
calculating traffic	339
determining	337

C

Call Answer	
greetings	67
Call Me	
answering calls	227
configuring	226
creating rules	227
description	225
offline mode	227
service functions	45
Call notification	
Caller-requested Notify Me	231
Find Me	233
Intercom Paging	235
call progress	212
Caller Applications	
Aria mailboxes	59
description	59
functions	59
multiple mailboxes per extension	187
scheduling capabilities	60
Caller interface	
interfaces	
Automated Attendant	56
Avaya Common Caller Interface	57
Caller Applications	59
introduction	56
CCI	57
language selection	58
options	59
Centralized Modular Messaging	374
topologies	374
Centum Call Seconds	
calculating busy hour	339
sizing ports, using	339
Class-of-Service (COS)	
definition	451
options for Exchange and Domino	453
options for MSS	451
Common Caller Interface	57
Common Channel Signaling (CCS)	211 , 218

D

Digital Set Emulation	
switch integration	212
DUC support	97

E

Erlang	
calculating busy hour	339
sizing ports, using	339

Exchange server	
voice mail domain design rules, Exchange 2000	247
voice mail domain design rules, Exchange 2003	247
voice mail domain design rules, Exchange 2007	246

F

fax routing address	
enabling subscribers	199
Fax sender service	
functions	46
fax servers	
interoperability, requirements	198
MSS native fax resource	194
routing inbound fax calls to	200
faxes	
enabling subscribers	199
routing to third-party fax servers	200
Find Me	
configuring	234
description	233
offline mode	235
using	234

G

G.711	
audio encoding	37 , 127
G.711 audio encoding	
A-law and mu-law	127
Glossary	477
Grade of service (GOS)	
Erlang B and Erlang C tables	381
Graphical user interfaces (GUIs)	
IBM Lotus Domino GUI clients	71
introduction	70
Microsoft Exchange GUI clients	71
MSS GUI clients	70
GSM	
audio encoding	126
GUI clients	
Avaya policy	385 , 451 , 455
IBM Lotus Domino Unified Communications (DUC)	71
iNotes	71
Modular Messaging IBM Lotus Notes Client	84
Modular Messaging Microsoft Outlook Client	72
Modular Messaging Microsoft Restricted Outlook Client	77
Modular Messaging Web Client	93
Outlook Web Access (OWA)	71
Subscriber Options	87
Web Subscriber Options	89

H

heat dissipation	389
Hunt algorithm	359
Hunt group	
description	219
types.	219

I

IBM Lotus Domino	
cluster	171
description	51
server	51 , 171
versions	51
voice mail domain design rules	249
Incoming faxes	194
manage	194
integrated voice mailbox	
introduction.	97
Intercom Paging	
configuring	235
description	235

L

language support	33
Licensing	
mailboxes	125
TTS sessions.	125
local mailbox numbers	
addressing	176

M

Mailbox Monitoring Server	222
MAS	459
Message categories	
Deleted messages	66
description	65
Draft messages.	66
New messages	65
Saved messages	65
unsent voice messages	64
Message Networking server	
considerations	447
description	189
Message notification	
Call Me	225
capacities	221
MWI	222
Notify Me - Automatic	228
Message privacy	
accessing private messages.	146

Call Answer message privacy	147
creating private messages	145
description	145
PEL	148
Privacy Enforcement Level.	148
privacy parameters summary.	153
Restrict Client Access COS	152
standard RFC822 header	152
message store	
functions	50
Messaging application server	
alarms and logs	120
capacities.	256
functions	40
load balancing	350
Messaging in offline mode	
Microsoft Exchange backup	170
Microsoft Exchange	
description	51
Modular Messaging	
administration	35
administration tools	
Voice Mail System Configuration	42
backup capabilities	158
benefits summary	31
desktop deployment support	92
diagnostic and reporting tools	
MMSnap Utility.	44
Operation History Viewer	44
Port Monitor	44
Reporting Tool	44
interfaces	55
key features and capabilities	104
multiple language support	33
native networking	188
networking	188
notification	
multiple notifications	237
one-number connectivity	237
types	221
reporting capabilities.	101
software components	41
TUIs	32
versions	23
Modular Messaging Exchange lists	
global distribution list	133
Modular Messaging TUIs	
access private messages	63
access unsent voice messages.	64
Answering Call Me calls	62
common mailbox model	64
configure Personal Operator	64
COS	61
create private messages	63
PDLs	64

Index

Subscriber login	61
Modular Messaging Web Client	
client requirements	408
description	93
PDLs	94
privacy	95
Web server requirements	408 , 410 , 425 , 439
MSS capacities	254
MSS feature	
Community ID	130
sending restriction	130
MSS GUI clients	
Avaya policy	96
MSS lists	
Broadcast	134
ELA	132
multiple language support	33
Multiple time zones	
COS level	156
description	156
subscriber level	156
system time zone	156
VMD level	156
MWI	
capacities	221
configuration	223
features	
manual reset	224
refresh on demand	223
offline mode	223
providing notification	222
server functions	45
status	67
using	222

N

network traffic, sizing the system	343
Notify Me	
Automatic	
capabilities	228
configuring	229
creating rules	230
description	228
Caller-requested	
configuring	232
creating rules	232
description	231

O

Octel Analog Networking (OAN)	188
offered traffic	338
offline messaging	
Call Answer message access from TUI.	169

Domino message store offline	171
e-mail clients in offline mode	172
Exchange peer server offline	171
message store offline	168
Outgoing faxes	195
manage	195

P

PDL	
addressing from Aria TUI or Serenade TUI	141
addressing from AUDIX TUI	141
addressing from GUI clients	142
addressing from UCC Speech Access client.	143
capacity limit	136
circular PDL	143
creating from Subscriber Options or Web	
Subscriber Option	139
creating from TUIs.	138
description	136
handling deleted subscribers or deleted PDLs	144
identifier	137
invisible address	144
List ID	138
list members	136
List number	138
managing from Subscriber Options or Web	
Subscriber Option	140
managing from TUIs.	140
recorded list name.	138
text name	137
Personal Operator	64
Per-subscriber basis options	455
POP3 client limits.	370
ports	
requirements	341
Primary mailbox address	
messages to networked systems	175
Notify Me	175
Privacy Enforcement Level	
Full	148
Notification Only.	150
Partial	149

Q

QSIG D channel integration	
E1 digital trunks	211
T1 digital trunks	211

R

Reporting Tool	
definition	44

Reports	
listing of	459
samples	463

S

scalability	
multiple switches per voice mail domain	31
scheduling	
Automated Attendant	57
Caller Applications	60
secondary extension	
Call Answer	186
Call answer	186
Caller application	187
Outcall feature	187
security patches	22
Server software components	39
Administration, diagnostic, and reporting tools	42
Call Me Service.	45
Data Collection Tool	46
Fax Sender Service.	46
Mailbox Monitor Service.	45
Message store	50
MWI Service	45
Offline Call Answer Store	47
Tracing Service.	44
Web server.	47
Serviceability	
alarms, events, error logs	120
signaling	218
Common Channel Signaling.	218
sizing	
additional network traffic	343
determining busy hour	337
worst case network load.	344
SNMP	
acknowledgment	123
alarm notification	123
definition	119
queries.	119
standards-based clients	
Avaya support policy	96
IMAP4 and POP3.	96
Subscriber interface	
common Call Me interface.	62
common log-in interface.	61
common mailbox model	64
common Offline Access interface	62
features	63
multilingual TUI.	68
Subscriber Options	
description	87
functions	88
subscribers	

fax-enabling.	199
supplementary server.	412
switch integration	
Digital Set Emulation	212
features.	214
H.323.	210
matrix	216
QSIG D channel.	211
RS-232 serial	213
Session Initiation Protocol (SIP)	209
telephony concepts	209
System lists	
Enhanced-List Application (ELA)	132
global distribution lists	133
mailing list groups	133

T

Telephone user interface (TUI)	
interfaces	
Caller interface.	56
Subscriber interface	60
introduction	56
privacy announcement.	151
telephony	
concepts	207
text-to-speech	
description	117
Messaging application server component	335
multilingual	117
Tracing Service	
functions	44
introduction	44
TUI addressing	
Dial-by-Name	177
local mailbox numbers	176
network address.	178
numeric address	176

U

Unified Communication Center (UCC) Speech Access	98
Unified messaging	
Unified access	24
Unified message store	26
UPS	
sizing.	389

V

Voice mail domain (VMD)	
capacities.	252
definition	53
general rules	240

Index

Voice Message Form. [97](#)
voice port
 telephony concepts [208](#)

W

Web Subscriber Options
 description [89](#)
 functions [89](#)
 requirements [438](#)
worst-case network load, calculating [344](#)